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A SYSTEM OF

GENITO-URINARY DISEASES

SYPHILOLOGY AND DERMATOLOGY.

BY VARIOUS AUTHORS.

EDITED BY

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VOL. III.—PART I.

DERMATOLOGY.

WITH NUMEROUS ILLUSTRATIONS.

EDINBURGH & LONDON:
YOUNG J. PENTLAND,

1894

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P R E F A C E .

As set forth in the prospectus, it was intended that the series of volumes composing this "System" should form a systematic and practical treatise on genito-urinary, venereal, and skin diseases, giving a complete picture of the present knowledge of these diseases, and sufficiently comprehensive to serve as a compendium of reference. How fully and completely this object has been attained will appear from an examination of the three volumes, of which the present is the concluding one.

In the effort to present a compendious record of the numerous and important additions made to our knowledge of these diseases within recent years, it was found difficult to compress this mass of material within the limits of conveniently sized volumes. In the preparation of Volume III this difficulty has been enhanced by the addition to our nosological category of a large number of new diseases. A comparison of the Table of Contents of this volume with that of the text-books on dermatology of a few years ago will show that no fewer than forty diseases are now recognized as distinct clinical entities which were then unknown or identified with other dermatoses. New and improved methods of investigation have given us a clearer insight into the intimate nature of many morbid states, necessitating the use of new terms to convey a correct conception of the pathological conditions.

The extraordinary activity displayed in the field of dermatology has not been simply in the direction of introducing new terms and names of diseases. Recent researches into the etiology and bacteriology of diseases of the skin have resulted in a clearer comprehension of the essential nature of many diseases formerly obscure, and established the pathological unity of certain affections which were previously regarded as wholly unrelated to each other—such, for example, as the various forms of Tuberculosis of the Skin, the group of Seborrhoeic Diseases, the bullous affections com-

prehended under the general term Dermatitis Herpetiformis, the several diseases now recognized as due to psorospermial infection and classed as Psorospermiosis Cutis, etc.

The task of arranging and classifying this new material, of selecting contributors best fitted to write on particular subjects, and of assigning to each of the more than two hundred subjects embraced in this volume a space commensurate with its importance, has been by no means an easy one. It has been the aim of the editor to produce, with the co-operation of the contributors, a coherent, symmetrically proportioned work, complete in all essential details and thoroughly up to date.

The editor's acknowledgments are due Dr. J. Nevins Hyde, the chairman of the Statistical Committee of the American Dermatological Association, for his courtesy in furnishing the combined returns of this association, embracing over two hundred thousand cases of skin diseases tabulated so as to show at a glance the statistical frequency in this country of each particular disease.

The colored illustrations in this volume have, for the most part, been reproduced by the coloritype process, thus assuring photographic accuracy of detail, while the half-tone plates and illustrations in the text leave nothing to be desired from an artistic standpoint.

NEW YORK, *March, 1894.*

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DISEASES OF THE SKIN.

PART I.—GENERAL.

ANATOMY AND PHYSIOLOGY OF THE SKIN.

By LOUIS HEITZMANN, M. D.

I. ANATOMY.

A KNOWLEDGE of the anatomical and histological features of the skin is of the utmost importance to any one who wishes to make a study of its pathology, for a thorough understanding of the latter is only possible if the anatomy is well comprehended. The same disease may at one time affect only a few of the elements of which the integument is composed, whereas at another time it may involve almost all its structures. It is therefore clear that a study of the normal structures of the skin will materially aid in the appreciation of its diseases.

The *general integument* (*Integumentum commune*) forms the external covering over the whole surface of the body, and is in intimate relation with its underlying structures. Its outer surface is not uniform, and both the eye and the touch can at once appreciate differences in its appearance and structure. The color varies considerably with age, sex, race, and climate, as well as in different localities, on the same individual. The dark color of the skin depends upon the presence of a larger or smaller number of blackish-brown pigment granules in the layers of the epidermis, and in the Caucasian race is most pronounced in the areolæ of the nipples, the labia, and the scrotum. The thickness greatly differs in different regions, being most pronounced over the palms of the hands and the soles of the feet, least so over the eyelids and the prepuce.

The surface of the skin is not smooth, but shows larger or smaller elevations and depressions due to the presence of furrows, ridges, pores, and hairs. The *furrows* are either long and deep or short and superficial, dividing the surface into a large number of oblong or lozenge-shaped fields. The former are found chiefly in the flexures of the joints, the latter run between the papillary elevations, and their direction is dependent upon the degree of tension of the skin. The *ridges* are mostly developed on the palmar surfaces of the last digital phalanges, and correspond to the rows of papillæ.

The *pores* correspond to the openings of the hair follicles, the sebaceous and the sweat glands. *Hairs* are present over almost the entire surface, being absent only on the palms of the hands, the soles of the feet, the last phalanges of the fingers and toes, the glans penis, and the inner surface of the prepuce. They vary greatly in their development, being large in the so-called hairy portions of the skin, small and thin, the lanugo hairs, over the other portions.

The skin consists of the following three well-marked layers, which are illustrated in the first partly diagrammatic drawing, representing a section through the normal skin: 1, *The epidermis*; 2, *the derma, cutis, or corium*, with the papillæ; and 3, *the subcutaneous tissue*, with the fat globules or adipose tissue. *Blood-vessels* and *lymphatics* are situated in the derma and subcutaneous tissue; *nerves*, on the contrary, in all three layers, except the outermost layer of the epidermis—the scarf skin. The *appendages* of the skin are four in number—viz., *sweat or sudoriparous glands, sebaceous glands, hairs, and nails*.

Histologically, only two tissues enter into the structure of the skin: first, epithelium, and, second, connective tissue, the former building up the epidermis, the latter the derma and subcutaneous tissue. The boundary line between the two formations is not even, but supplied with numerous smaller or larger protrusions of the derma, the so-called *papillæ*, the sum total of the papillæ being called the *papillary layer*.

Epidermis.—The epidermis or epithelial layer, the most external of the layers of the skin (Fig. 2), consists of the following three distinct strata from without inward: (*a*) The horny layer, stratum corneum, or scarf skin; (*b*) the stratum lucidum or pellucidum of Oehl; and (*c*) the mucous layer, stratum or rete mucosum, or rete Malpighii. Its thickness varies greatly in different parts of the body, being dependent chiefly on the varying thickness of the horny layer, and is greatest in the palms of the hands and the soles of the feet.

(*a*) The **stratum corneum**, the most external portion, is composed of several layers of flat, imbricated scales or epithelia, which in vertical section appear spindle-shaped. Their horny nature is demonstrated by their irregular contour, by the want of granulations, and the absence of nuclei, though a nucleus is often faintly indicated in the lower layers. The outermost scales are more wrinkled and irregular than those found in the deeper portions, and are entirely without life. These epidermal scales desquamate during life, but their mode of growth is not yet settled. In persons of dark complexion the horny epithelia exhibit a diffuse yellow color.

(*b*) **Stratum Lucidum.**—Immediately below the horny layer a narrow zone of nearly compact, glistening epithelia appears, which run parallel with the surface. Oehl has designated this layer the stratum lucidum;

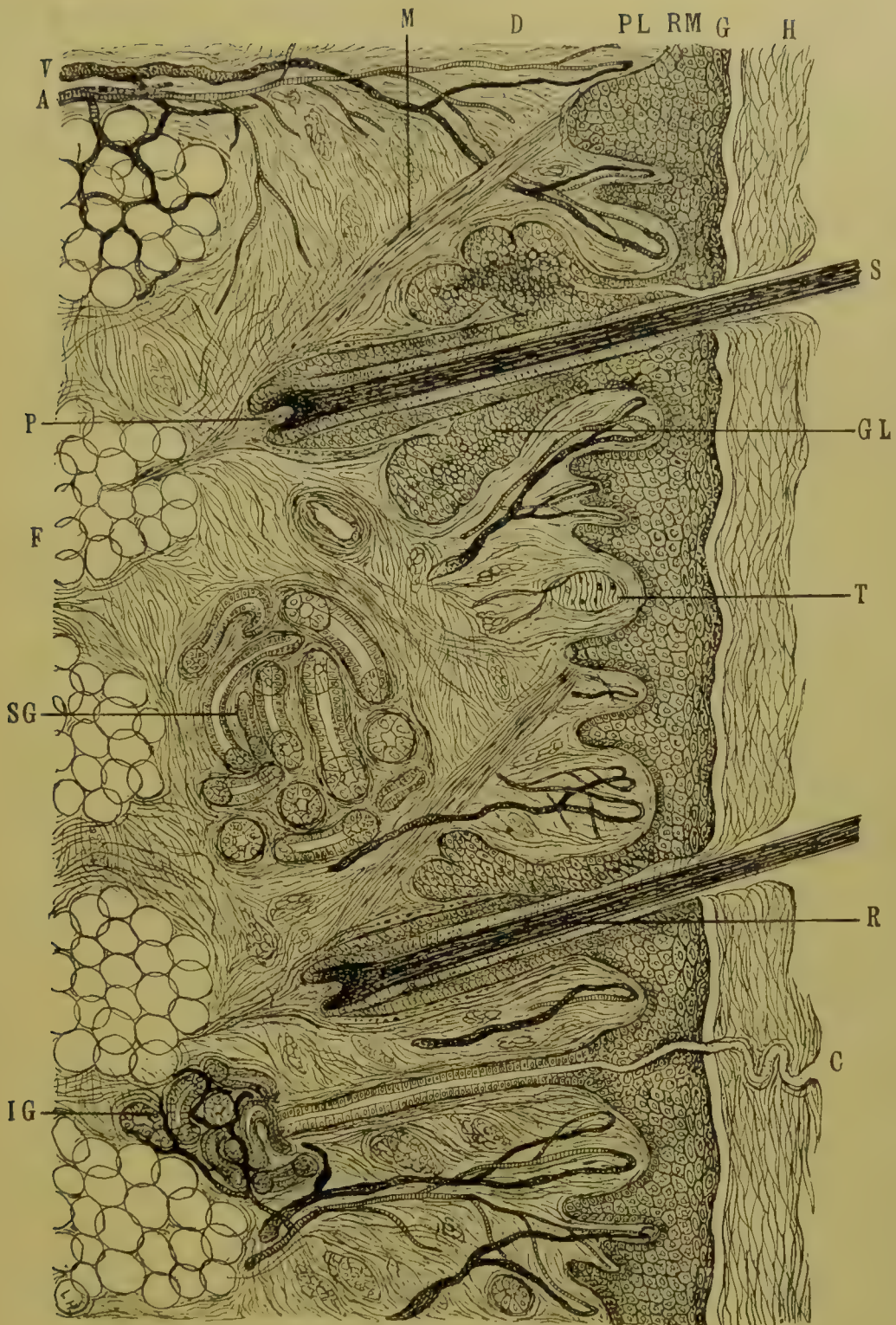


FIG. 1.—Diagram of the skin of man.

H, stratum corneum of the epidermis; L, stratum lucidum; G, stratum granulosum; R M, rete mucosum; D, derma; P L, papillary layer of derma; S, shaft of hair; R, root of hair, surrounded by the inner and outer root-sheath; P, papilla of hair; G L, sebaceous gland; S G, sudoriparous gland; I G, injected sudoriparous gland; C, corkscrew windings of duct of sudoriparous gland; M, arrector pili muscle; T, tactile corpuscle; A, artery; V, vein; F, subcutaneous fat tissue.

it is, however, not always well marked. Below it one or two strata of coarsely granular, nucleated epithelia are found, and have been called the *stratum granulosum* by Langerhans. Their granular appearance depends upon the presence of coarse, often pigmented granules of a peculiar chemical substance, which can easily be colored by certain reagents, such as hæmatoxylin and picrocarmin or methyleosin, variously called *eleidin* by Ranvier, because he believed it to be of a fluid form; and

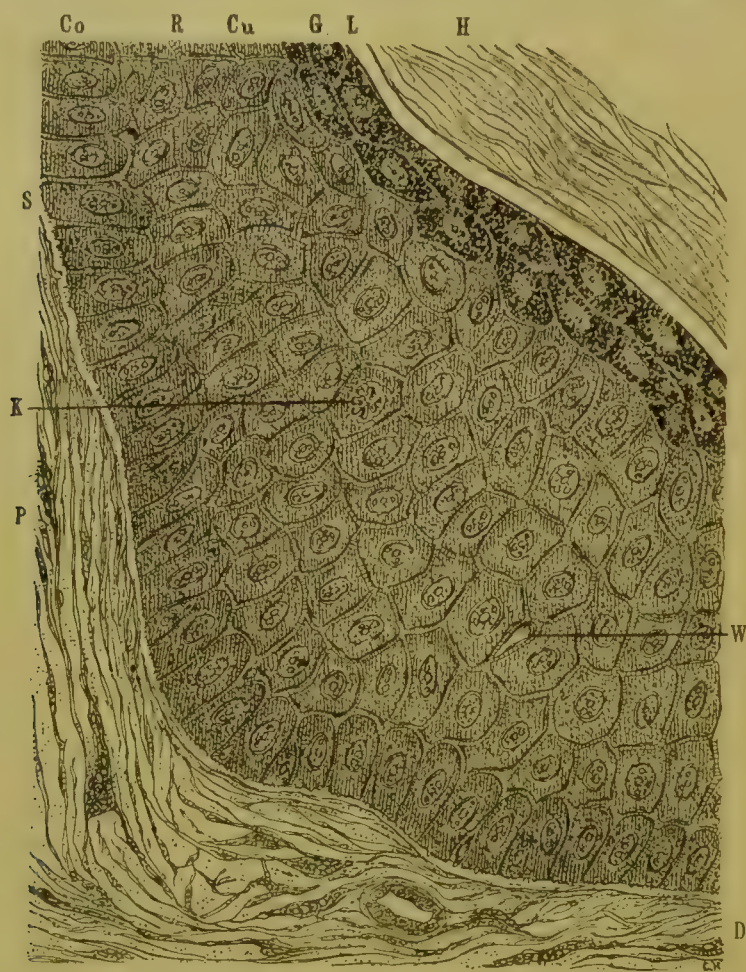


FIG. 2.—The epithelial cover of the skin or epidermis. Magnified 500 diameters. H, stratum corneum, composed of flat horny epithelia; L, stratum lucidum, a cuticular formation; G, stratum granulosum, pigmented coarsely granular epithelia; R, rete mucosum, or thorny layer, composed of (Cu) cuboidal epithelia in several layers, and (Co) columnar epithelia in a single layer; K, nucleus in karyokinesis or mitosis; W, wedge in the cement substance; S, apparently structureless or basement membrane (often absent); D, derma with a capillary blood-vessel, cut transversely; P, papilla.

keratohyalin by Waldeyer, who considered it to be of a more solid character—similar to hyalin, a result of the chemical changes in the first stage of the horny process. This layer is generally described as the uppermost layer of the rete mucosum.

(c) The **mucous layer, stratum or rete mucosum, or rete Malpighii**, is the deepest of the epidermal layers. It consists of irregularly polyhe-

dral, distinctly nucleated epithelia, rich in protoplasm, and diffusely colored by carmine and other coloring matters. The lowest layer consists of a row of columnar epithelia, with their long axis more or less perpendicular to the surface of the papillæ. The next two or three strata of epithelia are more or less polygonal, containing large and distinct nuclei, and the nearer they approach the granular layer the flatter they become, finally lying with their long axis parallel to the general surface.

The epithelia nearest the papillary layer are of a diffuse brownish color, holding a greater or lesser amount of pigment granules. In the Caucasian race these are best observed in the region of the nipple of the breast, the scrotum, the anus, and the external female genital organs. In the colored races the columnar epithelia contain numerous blackish-brown pigment granules, always scattered around the central nucleus, which itself remains uncolored.

According to the studies of Carl Heitzmann, which have been corroborated by Stricker, the epithelia are lumps of living matter, protoplasm, or, as it is termed by Beale, bioplasma, which, by their relations to each other, constitute a layer of reticulated living matter, not only on the outer surface of the body, but also on all cavities and elongations which are in direct or indirect communication with the outer surface. These elements are flattened by reason of their apposition, and separated from each other by a lifeless cement substance. All are, however, uninterruptedly united to each other by means of delicate spokes, spines, filaments, or thorns, the prickles of Max Schultze, which traverse the cloak of cement substance; hence the name "thorny layer" for the whole rete mucosum (Fig. 2). These thorns or filaments are especially well seen in places which were subjected to a slight continuous irritation. In this situation the cement-substance likewise holds small solid lumps of protoplasm, which are best marked and most numerous in the localities exhibiting the thorns most plainly. The ultimate branches of the nerves—so-called axis-fibrillæ—run in the cement-substance and inosculate with the thorns traversing the latter. Toward the periphery, in the stratum granulosum, the living matter is more abundant than in the rest of the rete mucosum.

The living epithelia of the rete mucosum and the lifeless scales of the horny layer are separated from one another by the intervening hyaline layer, the stratum lucidum. The former view that the dry plates of the horny layer are derived from the epithelia of the mucous layer has long since been found to be erroneous.

Development.—As regards the development of the epidermis, it consists in the first months of embryonal life of several layers of polygonal epithelia, the upper one or two layers being large and irregular, the lower

smaller. The outermost epithelia, which at first are found in a single layer, but afterward increase in number, are called by Bowen the "epitrichial" layer. He considers them to form a distinct histological layer, which disappears by the sixth month of foetal life.

Before proceeding to the description of the structure of the cutis a few words may be said as to the best manner of preparing specimens of the skin for microscopical examination. Fresh skin should at once be placed in a wine-yellow (about one fifth of one per cent) solution of chromic acid and allowed to remain in this reagent for about one week. Specimens thus hardened are now imbedded in an alcohol-ether solution of celloidin and cut with the microtome, then stained with a weak ammoniacal carmine color, and mounted in chemically pure glycerin. The old method of hardening in alcohol alone, staining with hæmatoxylin or eosin, or both, and mounting in Canada balsam, does not give satisfactory results; this method, which necessitates the use of some oil, such as oil of cloves, bergamot or cedar oil, to clear up the specimens, whereby the protoplasmatic interspaces shrink to a minimum, makes such sections unfit for study with higher powers of the microscope, and as long as it is resorted to, the minute structure will never become clear. Chloride-of-gold staining is excellent for certain sections. Unna, after hardening his specimens in alcohol, colors them with a basic methylene-blue solution, and decolorizes with a glycerin-ether mixture, then mounting in Canada balsam. Although by this method specimens are obtained which to the eye are very pleasing, the result is misleading, and it can not be recommended. Complicated staining processes, which are occasionally used, rarely enhance the clearness of the specimen.

Cutis.—The *cutis*, *corium*, or *derma* (Fig. 3) is composed of dense interlacing bundles of fibrous connective tissue, intermingled with elastic fibers and containing spindle-shaped anastomosing bodies, the so-called "connective-tissue cells." The bundles have a certain regularity of arrangement, as is demonstrated by the researches of C. Langer. This investigator punctured the skin with a shoemaker's awl, and after the withdrawal of the instrument observed in almost every instance, instead of round holes, longitudinal clefts, regularly distributed over the entire surface of the body. There are a few places, however, where the awl produces irregular, jagged openings in the tissue of the derma; these are most marked in localities where the derma is closely attached to the subjacent tissues.

The derma contains blood-vessels, nerves, lymphatics, hairs, glands, fat-globules, and a varying amount of smooth muscles. The *striped variety of muscles* is seen in the skin of the face and lateral aspect of the neck, the platysma myoides and its branchings into the superficial

muscles of the face. Bundles of *smooth muscle-fibers* are scattered throughout the derma, either in a fanlike or plexiform arrangement. The former appear throughout the skin wherever there are hairs or sebaceous glands, being termed *arrectores pilorum*; the latter are seen on those portions of the skin which are called erectile, such as the nipple,



FIG. 3.—Diagram of the minute structure of the derma. Magnified 500 diameters.

L, L, longitudinal bundles of connective tissue; E, E, elastic fibers bordering the bundles; T, transverse bundles; O, oblique bundles; C, capillary in interstice of the second order; I, branching protoplasm filling the interstices of the third order.

the scrotum, and the labia majora. Contraction of the fanlike muscles causes the condition known as goose-flesh—*cutis anserina*.

The derma is divided into two portions, an upper and a lower; the former is called the papillary layer, *pars papillaris*; the latter the reticular layer, *pars reticularis*.

Pars Papillaris.—The *papillary layer* (Fig. 1, P L), the outermost portion of the cutis, derives its name from its peculiar structure. It is composed of delicate fibers of connective tissue, not distinctly interlacing, and abundantly supplied with small nuclei. The connective tissue has the form of minute, fingerlike prolongations of varying size and shape in dif-

ferent localities, called the *papillæ*. The largest and most numerous papillæ are made up of a number of filiform elevations, which coalesce into a more bulky basis, and are found on the inner surfaces of the fingers and toes. In other places they form small conical or blunt protrusions. They are everywhere arranged in rows.

In horizontal sections the papillæ appear as light, circular, or oblong fields, marked in their central parts by the presence of transverse or oblique sections of capillary blood-vessels. Between these fields the interpapillary valleys of the rete mucosum are seen, which appearance gave rise to the name "rete mucosum." The number of these papillæ over the entire surface of the body is, according to Sappey, about 150,000,000.

According to their structure, two varieties of papillæ are distinguished, viz., the vascular and the nervous, the former containing the terminal loops of the blood-vessels, the latter the ultimate filamentous termination of medullated nerve-fibers, and these papillæ have only a limited vascularity.

Pars Reticularis.—The *reticular layer* (Fig. 1, D) forms the bulk of the cutis. It is denser in texture than the papillary layer, and is made up of interlacing connective-tissue bundles, which feature led to the designation "pars reticularis." These bundles are coarsest in the lower portion, near the subcutaneous connective tissue, and finest in the papillary layer.

Elastic fibers (Fig. 3, E), which are developed from protoplasm, are present in large numbers in the derma in advanced age, especially in its upper part; in the newborn infant they are absent, in early life scanty. Unna has described a complicated method of coloring these fibers with osmic acid and aniline colors, which method can, however, not be considered as reliable, since these reagents also color the protoplasmic tracts between the bundles. They do not take up carmine colors, and on account of their high refraction show very plainly in specimens hardened in chromic acid and stained with ammoniacal carmine. The last-named observer claims that these elastic fibers are especially abundant around the sudoriparous glands, but subsequent observations do not bear out this statement.

In describing the *intimate structure of the cutis* Tomsa speaks of three substances building it up: first, the collagenous, building up the bundles themselves; second, the elastic, producing a frame at the borders of the bundles; and, third, the cement substance, pasting the bundles together, but holding at the same time, at least in many places, light central canals, in which a granular substance, the finest offshoots of the protoplasmic bodies, may be seen, more especially in sections of entirely fresh pieces of the skin.

If we study a section of the cutis in places where the connective-tissue bundles are chiefly cut in a transverse section, the similarity of the struc-

ture with that of the tendon becomes at once apparent. We see groups of connective-tissue bundles, which are separated from each other by rather broad interstices; they are made up of loose fibrous connective tissue, with numerous spindle-shaped and lobular protoplasmic bodies, and this delicate connective tissue accompanies all the larger blood-vessels, especially the arteries and the veins, and the medullated nerve-fibers. The interstitial connective tissue ramifies into smaller offshoots, which again surround a certain number of connective-tissue bundles, just as is the case in the tendon, by means of the offshoots of the peritendinous connective tissue. The secondary offshoots of the connective tissue contain arterioles, small veins, and capillaries, though not in large numbers. From the interstices of the second order smaller offshoots are continued between the bundles; these contain only little fibrous connective tissue, but are made up almost completely of protoplasm, which, as a general rule, holds nuclei at the points of intersection of the network. As interstices of the fourth order, finally, we can denominate those which divide larger bundles into a number of smaller ones, though usually only in an incomplete way; the latter corresponds to the cement substance of Tomsa. In the smallest interspaces, nuclear bodies and some surrounding protoplasm can here and there be seen; the protoplasm, however, becomes the more indistinct the finer the interstices and the older the individual. At first glance we can perceive at such places an almost completely closed network, which is formed of a delicate fibrous connective tissue wherever it is coarser, of protoplasm wherever it is finer.

In bundles cut in a longitudinal or oblique direction we discover a delicate striation, the presence of which has led to the term "fibrous connective tissue." The fibrillæ are artificial products, and not visible as such as long as the connective-tissue bundles are not torn or treated with certain reagents.

The structure of the papillary layer shows differences according to the age of the individual. The younger the individual the more delicate is the fibrous connective tissue, and the older the individual the coarser are the connective-tissue bundles found in this layer.

Development.—The history of development of the cutis is extremely interesting. At the end of the fourth week of embryonal life we see nothing else but medullary or indifferent or embryonal corpuscles. If we examine the lower extremity at this stage we will find everything in a state of indifference; there is no trace of muscles, cartilage, or blood-vessels. The surface is covered with several layers of epithelia. With higher powers of the microscope differences in the structure of the indifferent elements are visible. We see shining, nearly homogeneous lumps, in which no structure can be discerned; also larger elements which are not completely homogeneous, showing lighter and darker places in their

interior. Furthermore, we observe lighter and granular, mostly oblong bodies, of a pronounced reticular structure, the granules being connected with each other by means of fine spokes. The transformation to reticular protoplasm is most pronounced at the surface, immediately beneath the epithelia. In this situation, which corresponds to the future cutis, the nuclei are oblong or spindle-shaped.

Between the second and third month of intra-uterine development the transformation of the indifferent elements to oblong or spindle-shaped

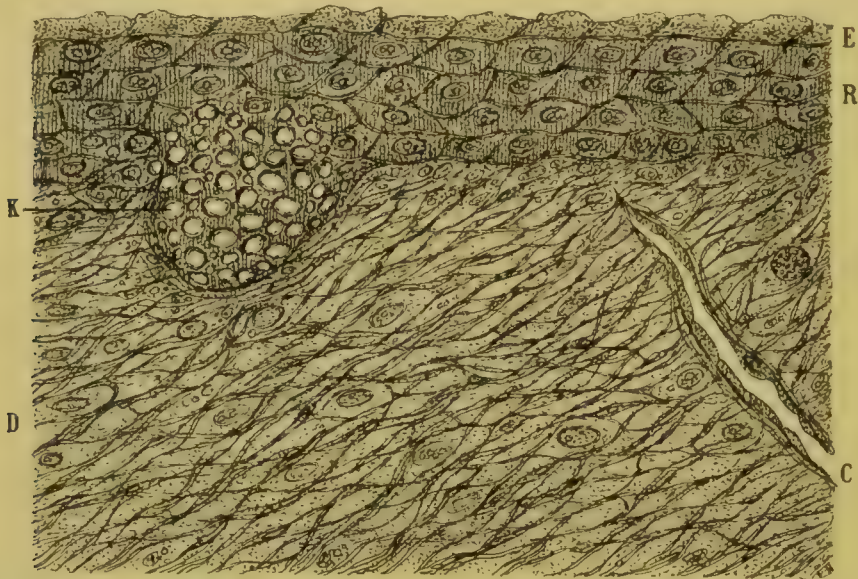


FIG. 4.—Skin of human embryo three months old; vertical section. Magnified 500 diameters. E, epidermis; R, rete mucosum; K, first-formed knob of a future hair; D, derma, made up of myxomatous tissue; C, capillary blood-vessel.

protoplasmic bodies has become more pronounced. In the deeper layers of the future cutis we for the first time meet with delicate bundles of fibrous connective tissue. At this stage we observe the first blood-vessels arising from elongated tracts of living matter, which afterward by vacuolation become hollowed out and contain hæmatoblasts and red blood-corpuscles.

The next stage in the history of development of the cutis is found in the skin of an embryo three months old (Fig. 4). The epithelial layer has become thicker. From the lowest row, the future columnar epithelium, knob-shaped elongations have formed at the commencement of the third month; these are the future hairs and root-sheaths. The tissue of the cutis has become fibro-myxomatous, the superficial layers being chiefly of a myxomatous, the deeper of a fibrous, structure. Around the oblong nuclei there is a zone of light, spindle-shaped fields, which are separated from the neighboring fields by nucleated, delicate, spindle-shaped fibers. Two kinds of basis substance evidently exist here: first,

the one which infiltrates the protoplasm around the nuclei—the myxomatous; second, the one which infiltrates the fibers proper—the collagenous. Hæmatoblasts and blood-vessels are not yet very numerous.

In the fifth month the myxomatous tissue has disappeared, and a more collagenous basis substance made up of spindles of varying sizes has taken its place. Non-medullated nerve-fibers in large numbers traversing from below to the surface are present in these sections. Between the sixth and seventh months the infiltration with collagenous basis substance has become more marked. A papillary body proper can not yet be seen. The unevenness on the surface is due to numerous developing hairs. In the eighth month the papillary body begins to develop. It is composed of numerous protoplasmic bodies, between which are scanty spindles also of a reticular structure. Well-formed capillary blood-vessels are now present and quite numerous.

At birth the papillæ are made up of a delicate fibrous connective tissue, which, however, is in reality not composed of fibrillæ but of pale spindles, of varying sizes, which evidently contain the basis substance.

Subcutaneous Tissue.—The subcutaneous tissue, which lies immediately below the derma, and into which the latter gradually merges, consists of bundles of fibrous connective tissue crossing one another and interlacing in such a manner as to produce rhomboidal spaces. The bundles are continuous with the subjacent fasciæ and aponeuroses of the muscles. The rhomboidal spaces contain numerous groups of fat-globules, which are arranged in lobules and are separated from each other by delicate fibrous connective tissue with a comparatively abundant supply of blood-vessels having an affërent artery, one or two efferent veins, and a capillary plexus. The fat-globules are spherical vesicles consisting of an elastic capsule, with an oval nucleus at one point and a drop of oil filling the cavity of the vesicle. The fat may be extracted with ether. This structure is called the *adipose tissue*, *panniculus adiposus*, or *stratum adiposum* (Fig. 5). It is found in large quantity about the mammary glands after childbirth, the palms of the hands, and the soles of the feet. In other places, as the eyelids, the auricles of the ears, the labia minora, the penis and the scrotum, fat-globules are absent. Where the cutis is especially thick, as on the back and shoulders, fat columns pass upward from the adipose tissue in an oblique direction to the bases of the hair-follicles, especially to those of the fine hairs (J. Warren). The axes of these columns are parallel to those of the arrectores pilorum. Besides blood-vessels, lymphatics and nerves are found in this layer. The coil of the sweat-glands and the lower part of the deep-seated hair-follicles frequently reach the subcutaneous tissue. The fat tissue gives to the skin its tension and fullness, and to the body its appearance of roundness and plumpness. In cases of starvation and wasting diseases the

fat-globules disappear to a greater or less extent, and the skin becomes wrinkled and flaccid. In obesity, on the other hand, there is an overproduction of fat.

Blood-Vessels.—The skin is abundantly supplied with blood-vessels, nerves, and lymphatics. These are arranged in two parallel horizontal layers, a deeper, in the subcutaneous tissue, and a more superficial, immediately beneath the papillæ. They are more numerous on the flexor than on the extensor surfaces of the extremities. According to the accurate researches of Tomsa, in 1873, the skin everywhere has really three sepa-

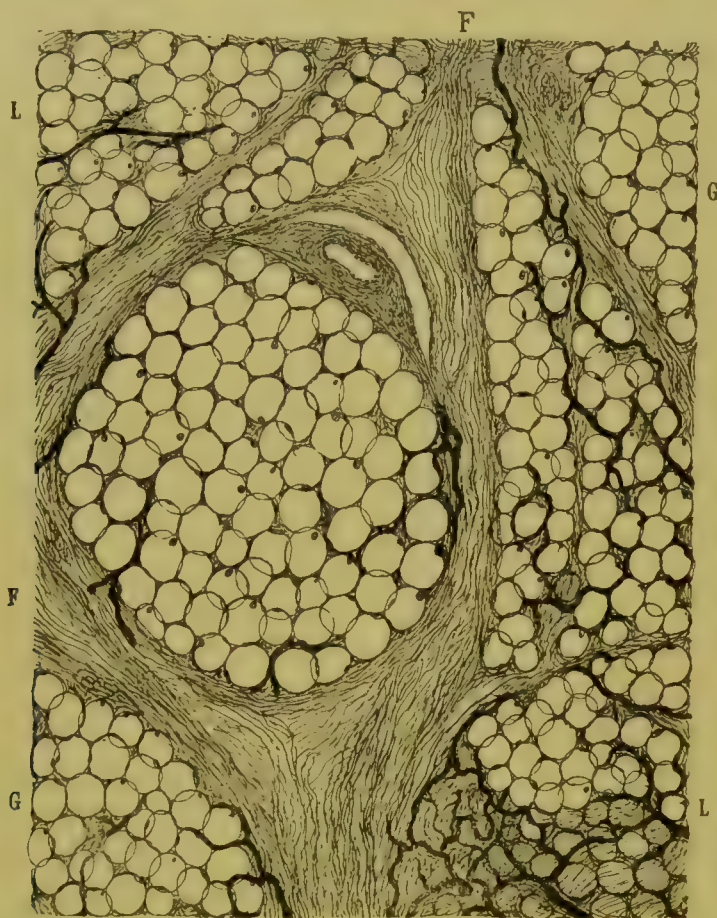


FIG. 5.—Subcutaneous fat tissue with injected blood-vessels. Magnified 150 diameters. L, L, lobules of fat tissue; F, F, fibrous connective tissue between the lobules; G, G, fat-globules, so-called fat-cells, with nuclei in their capsules. Fat extracted by spirits of turpentine.

rate vascular districts, each of which is supplied with its own arterioles and roots of veins. The deepest is that of the subcutaneous fat tissue; the next is that of the sweat-glands and the most superficial belongs to the derma, with its hair-follicles and sebaceous glands. The arterioles which supply the fat tissue are numerous, corresponding to the large number of capillaries; those of the sweat-glands run to the coils, supplying the tubule with capillaries, and empty into two or three small veins,

one of which always runs upward along the duct of the sweat-glands and anastomoses with veins of the papillary layer. The artery then ascends to the papillary layer of the derma, and in its course branches into capillaries which go to the hair-follicles, the sebaceous glands, and the papillæ. Before reaching the papillæ the arteriole splits into precapillary ramules, from which the capillaries proper arise. The latter form loops, which as a rule are single, but in the largest papillæ double, and unite into an extended flat reticulum of a venous character. In places where the papillæ are large there is a double layer of veins, the superficial arranged in narrow and elongated meshes, the deeper, on the contrary, in wide and more circular ones. These vessels give rise to venous branches, uniting at acute angles into larger veins, which produce arches and receive the veins of the sweat-glands and the fat-lobules. The hair-follicles have between their layers wide, transversely arranged capillaries, which also penetrate the inner layer. In the upper portion of the follicle numerous anastomoses exist with the capillaries of the papillary layer, and in this situation arise the capillary loops for the supply of the sebaceous glands. All these capillaries unite into an irregular venous network, which is lodged in the external layer of the hair-follicle and anastomoses freely with the venous vessels of the papillary layer. The papilla of the hair has its own arteriole, which branches into looped capillaries. The whole vascular system, it can easily be seen, thus plays an important part in the pathological condition of the skin.

Nerves.—Nerves, both of the medullated and non-medullated variety, are found in abundance in the skin, derived from subcutaneous branches, as a rule, accompanying the blood-vessels. They are especially numerous in the palms of the hands and the soles of the feet, particularly in the skin covering the last phalanges of the fingers and toes. Up to about twenty-five years ago nonmedullated nerve-fibers were unknown in the skin, but later researches have shown that these exist in great numbers, terminating in a delicate plexus between the epithelia of the rete mucosum. The medullated nerve-fibers end in peculiar bodies called the *tactile* or *Meissner's* corpuscles and the *Pacinian* or *Vater's* corpuscles. In the cutis some of the medullated nerve-fibers lose their medullary sheath and continue as non-medullated fibers. The nerve bundles, according to Robinson, pass upward through the corium to the subpapillary region, where many of them change their course and run in a horizontal direction. Some fibers, before reaching this region, return to the deeper parts of the corium to reascend, forming a curve with the concavity to the free surface. Some of the horizontally running fibers form a plexus around the subpapillary vessels and capillaries of the papillæ.

The Tactile Corpuscles, Corpuscles of Meissner or of Wagner (Fig. 6), are ovoid or roundish bodies, almost always situated within a papilla,

though occasionally somewhat beneath it, as a general rule occupying the greater portion of the papilla, which is usually devoid of blood-vessels. These corpuscles are best stained with a weak chloride of gold solution, after being previously subjected to the action of acetic acid or a weak solution of potash. Their number varies in different parts of the body,

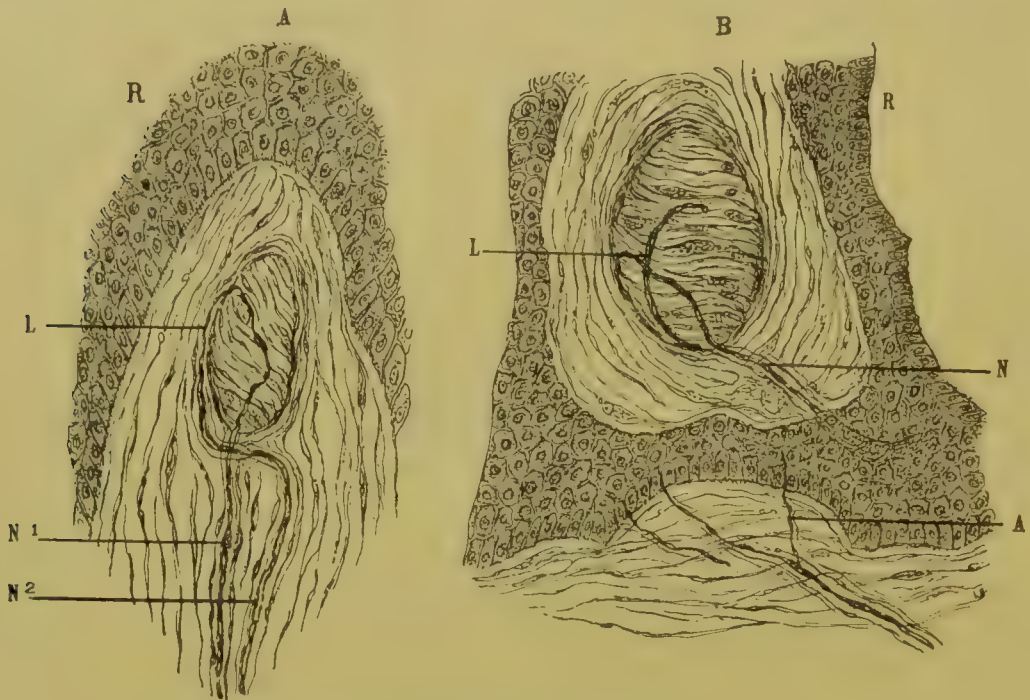


FIG. 6.—Tactile corpuscles from finger-tips; stained with chloride of gold. Magnified 500 diameters.

- A. Papilla in longitudinal section.—N¹, medullated nerve; N², second medullated nerve; L, loop within the tactile corpuscle; R, rete mucosum.
 B. Papilla in oblique section.—N, medullated nerve; L, two loops within the tactile corpuscle; A, axis fibrillæ running into cement substance between the epithelia; R, rete mucosum.

being most numerous upon the fingers, especially the last phalanges, the palms of the hands, and soles of the feet. They are found in about one fourth of the papillæ, and are from $\frac{1}{250}$ to $\frac{1}{300}$ of an inch long, and $\frac{1}{200}$ to $\frac{1}{500}$ of an inch broad. They are composed of finely interwoven spiral connective-tissue fibers, with small nuclei. Around them a somewhat denser connective-tissue capsule is seen. One or two medullated nerves, the afferent nerves, enter the corpuscle at one extremity, their myeline sheath being lost in the fibrous mass of the capsule. The axis-cylinder divides into a number of delicate fibrillæ, running with the spiral fibers. The nerve branches retain a spiral course all along the tactile corpuscle, anastomose with one another, and terminate in slight pear-shaped or cylindrical enlargements. According to A. R. Robinson, however, the nerve, after a greater or less number of windings, leaves the capsule at the apex as an efferent nerve. Two or more isolated tactile corpuscles may be attached to one or two nerves.

Pacinian, or, more correctly, **Vater's corpuscles**, having been first discovered by Vater, are most numerous in the subcutaneous tissue about the palms, soles, fingers, toes, and the male genital organs, especially the corpora cavernosa, and the prostate. They are very abundant in the mesentery of the cat. They are quite large, of an oval, more or less pointed shape, in some places easily perceptible to the unaided eye, the largest being about $\frac{1}{20}$ of an inch long and $\frac{1}{30}$ of an inch broad. Each corpuscle (Fig. 7) is connected with a medullated nerve-fiber, and is composed of a large number of lamellæ, or capsules, more or less concentrically arranged around a central elongated or cylindrical clear space. The capsules are thinner at the periphery than in the central portions. Each capsule consists of a hyaline, probably elastic ground substance, in which are imbedded here and there fine bundles of connective-tissue fibers; on the inner surface of each capsule is a single layer of nucleated endothelial



FIG. 7.—Pacinian corpuscles from the derma of the palm of the hand; stained with chloride of gold. Magnified 500 diameters.

A. Transverse section. B. Longitudinal section.

plates. Each corpuscle possesses a stalk, which consists of a single medullated nerve-fiber, accompanied by fibrous connective tissue; outside of this is a limiting membrane, and most externally a number of lamellæ, like the capsules. The medullary sheath and sheath of Schwann cease at the entrance of the nerve into the central clear space. This central space contains the axis-cylinder, around which is a space filled with a transparent substance, in which rows of spherical nuclei may occasionally be perceived along the margin of the axis-cylinder. Near the distal end

of the central space the axis-cylinder divides into two or more branches, and these terminate in pear-shaped, oblong, spherical, or irregular-shaped granular-looking enlargements.

Of the vaso-motor nerves of the skin very little is known. They are probably of two varieties, those connected with the central nervous system and those connected with ganglionic plexuses in the immediate neighborhood of the skin itself.

Lymphatic Vessels of the skin constitute a closed reticular system in two layers, interconnected by oblique branches. The superficial layer of capillary lymphatics is situated in the papillary portion of the skin, beneath the superficial layer of blood-vessels. It is composed of ramules, closer and narrower than those of the deep layer; from it the larger papillæ receive blind offshoots or shallow loops. Valves have been demonstrated in the walls of the larger lymphatic vessels of the subcutaneous connective tissue; they have not been seen in the smaller vessels. The hair-follicles as well as the sebaceous and sweat glands, according to I. Neumann, possess their own system of lymphatic capillaries. Blood-vessels and lymphatic, are found for the most part accompanying one another.

Sudoriparous Glands.—The sudoriparous or sweat glands (*glandulæ sudoriferæ*) are small, globular, reddish-yellow bodies, situated in the superficial portion of the subcutaneous tissue, or the deep part of the derma, being inserted in an oblique direction, the same as all the rest of the epithelial formations in the skin. They are present all over the skin, with the exception only of the glans penis, the inner surface of the prepuce, and the margin of the lips. They are most numerous in the palms of the hands and the soles of the feet, where, according to Krause, they number 2,685 to 2,736 to the square inch. Their total number in the skin is more than two millions. The largest are found in the axillæ and the neighborhood of the anus.

Each gland is a single tube coiled up and held together by loose connective tissue (Fig. 8). From each gland an excretory duct (Fig. 9), the *sudoriferous canal*, passes through the cutis in a slightly wavy and vertical direction toward the epidermis; it penetrates between the papillæ of the rete mucosum and the other layers of the epidermis more or less spirally, having in places where the epidermis is thick a characteristic corkscrew appearance (Fig. 1, C), and opens on the free surface of the skin. The orifices can in many places be seen with the naked eye, and are called *pores*.

The *coiled portion* of the tubule is lined with cuboidal epithelia, the duct up to the rete mucosum with columnar epithelia, both attached to a delicate hyaline membrane. The caliber, in the empty condition of the gland, is narrow, and the ledge of cement substance separating the single epithelia is plainly marked at the surface bounding the caliber. The

cement substance between the epithelia is traversed by delicate thorns serving for the interconnection of the protoplasmic bodies.

The connective tissue carries a number of capillaries, and produces a capsule surrounding the coil and prolongations passing around the tubule. In the connective tissue of the coil are smooth muscle-fibers, which are most numerous around the sudoriparous glands of the axillæ.

The diameter of the duct at its beginning does not exceed that of the tubule within the coil; it soon, however, becomes larger, and shows a

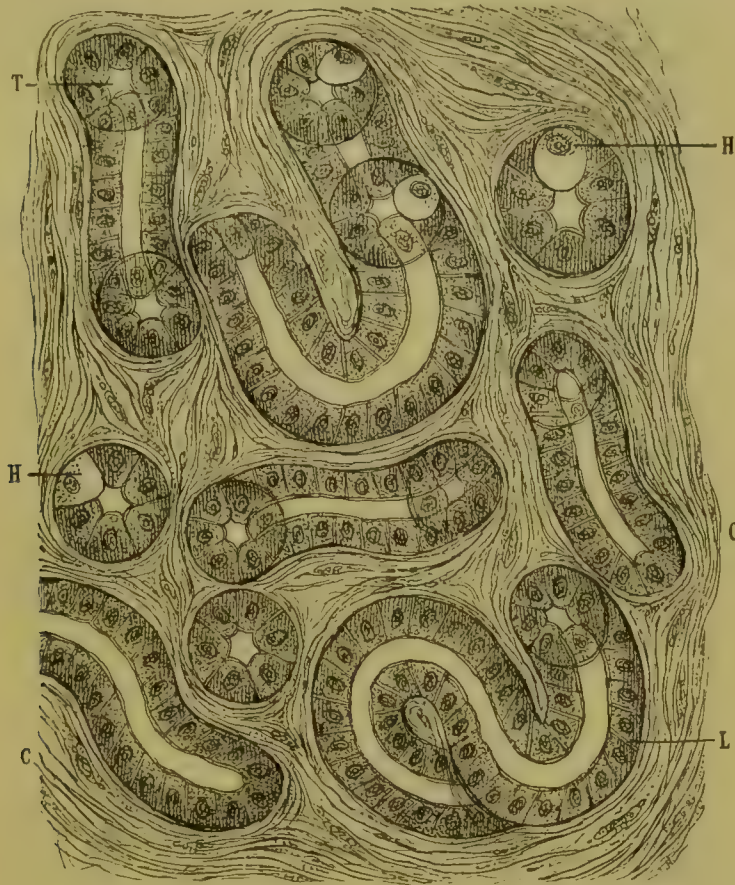


FIG. 8.—Coil of sudoriparous gland. Magnified 500 diameters.

L, tubule in longitudinal section; T, tubule in transverse section; H, H, hydropic epithelia filled with sweat; C, C, capsule of coil, delicate fibrous connective tissue.

single stratum of columnar epithelia and a wide caliber. Delicate tracts of connective tissue, arranged longitudinally, accompany the duct; no smooth muscle-fibers are present in them. In the depression between the papillæ the duct is composed of stratified epithelia, the prolongations of those of the rete mucosum. After having reached the epidermis the duct is lined by a single layer of flat epithelia, the caliber being rather wide, especially at its orifice on the surface of the skin.

The **formation** of the sweat-glands, according to Kölliker's assertion, commences about the fifth month of intra-uterine life. Robinson, however,

has demonstrated their origin in the third embryonal month at the palmar aspect of the fingers. In the seventh month the canal is formed, the lower end of the tube becoming dilated. In the last month of foetal life the tube becomes coiled and the gland proper is formed.

Sebaceous Glands.—The sebaceous glands (*glandulae sebiferæ*) (Fig. 1, G L) are acinous glands, situated in the corium, formed from the outer root-sheath of the hair and usually in close relation to the hair. They are, however, also found in places where no hairs exist, such as in the areola around the nipple of the female breast, in the glans and prepuce of the penis, in the nymphæ and in the prepuce of the clitoris. In the palms

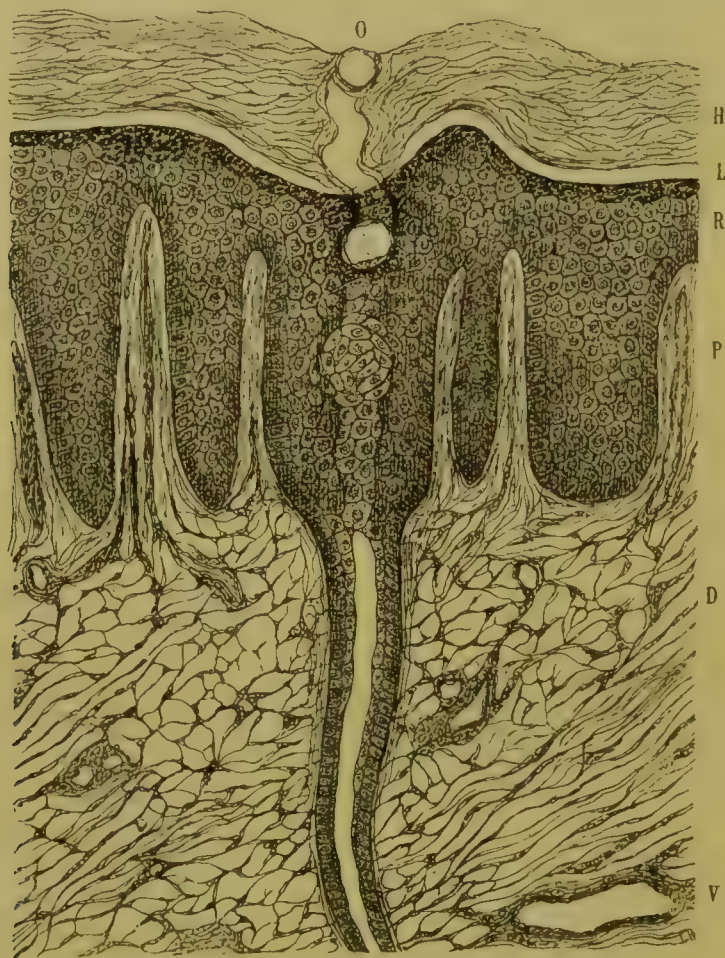


FIG. 9.—Duct of sweat-gland. Magnified 200 diameters.

O, opening of duct on surface; H, horny layer of epidermis; L, stratum lucidum; R, rete mucosum; P, papillary layer; D, derma; V, vein.

and soles and on the dorsum of the third phalanges there are no sebaceous glands. The largest are found in the naso-labial folds, the eyelids, scrotum, labia, and anus. They exist in great numbers throughout the scalp, and usually two empty into one hair-pouch, both being under the control of the same fanlike arrector pili muscle. In horizontal sections of the

scalp (Fig. 10) there are lobules composed of roots of hairs and sebaceous glands, inclosed by fibrous connective tissue, which sends delicate prolongations between the epithelial formations.

Each gland consists of the secreting portion or gland proper and the excretory duct, which opens between the inner root-sheath and the surface

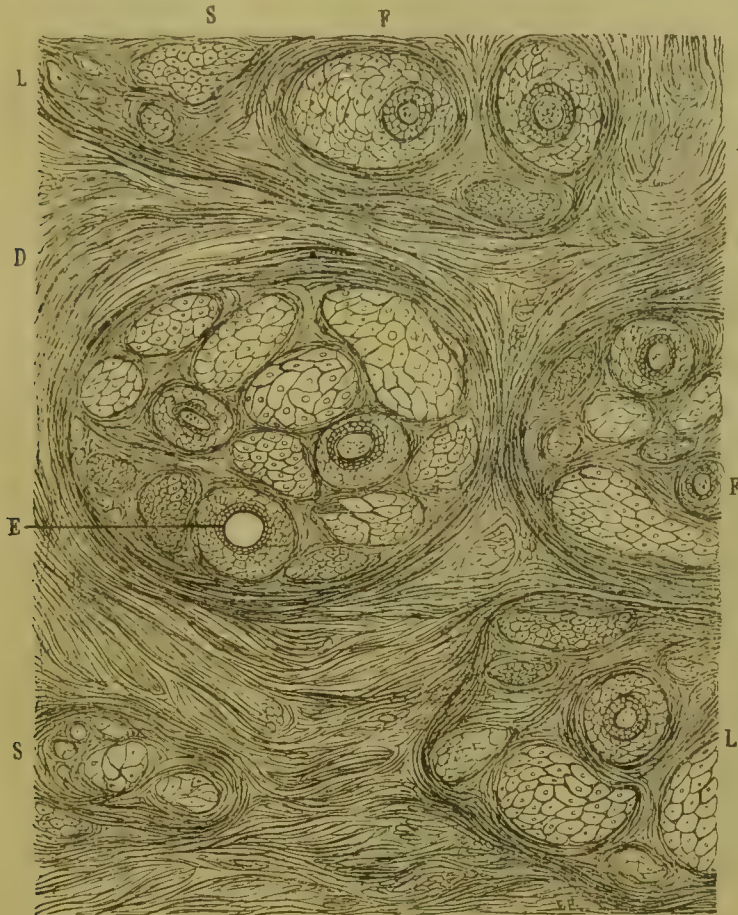


FIG. 10.—Scalp of a child; horizontal section; relation of sebaceous gland to hair-roots.
Magnified 100 diameters.

L, L, lobules produced by roots of hairs and sebaceous glands; F, F, follicles of hairs ensheathing the root-sheaths and roots; E, root of hair dropped out; S, S, sebaceous glands; D, D, derma of scalp.

of the hair; it is made up of a number of lobules, and usually has a pear-shaped form. The gland consists of a hyaline basement membrane externally, surrounded by dense connective tissue containing blood-vessels, nerves, and lymphatics; and epithelia, resembling those of the rete mucosum internally. The epithelia of the outermost layer are columnar, becoming larger and more or less cuboidal farther inward; the latter contain fat-globules, which increase in amount nearer the center of the gland. In the center itself, free fat, fat crystals, and remnants of epithelia are found. In many sebaceous glands, especially in their ducts, a parasitic mite, the *acarus* or *demodex folliculorum*, which, however, is harmless,

is seen. This mite usually lies in the duct with the head toward the gland, and, like all mites, has four pairs of legs.

The **development** of the sebaceous glands commences in the third month of foetal life, with the formation of a protuberance of the external

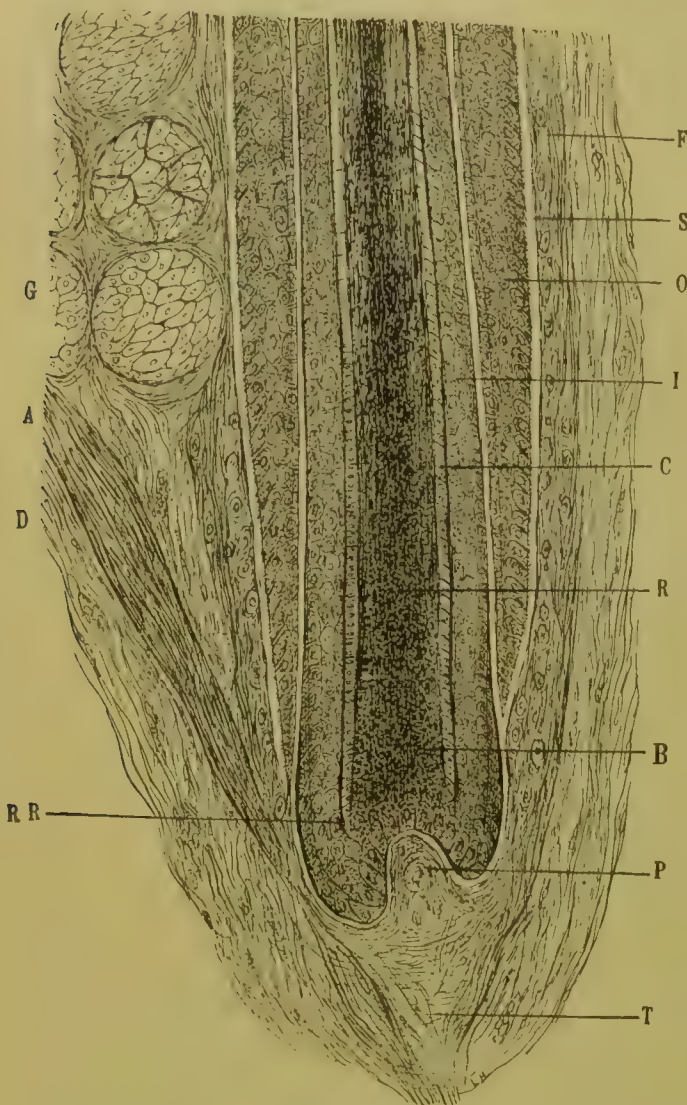


FIG. 11.—Root of hair; longitudinal section. Magnified 250 diameters.

P, papilla of hair; B, bulb of root; R, root of hair; C, cuticle of hair; I, inner root-sheath; R R, recurvation of inner root-sheath into the root; O, outer root-sheath; S, basement membrane; F, follicle, fibrous connective tissue, holding transverse sections of smooth muscle-fibers; G, acini of sebaceous glands; A, arrector pili muscle; D, derma; T, connective-tissue tract of follicle to subcutaneous fat-tissue.

root-sheath. It consists of epithelia, which, by subsequent multiplication and projection downward, form the gland.

Hairs. — The hairs (*pili*) (Fig. 11) are cylindrical, horny formations, implanted in depressions of the derma, the *hair-follicles*, which latter at the bottom of the follicle produce a *papilla*. Each hair is divided into two portions: the *root*, implanted in the skin, and the *shaft*, the free portion projecting above the surface of the skin. Hairs are found in all parts of the body, with the exception only of the palms of the hands, the soles of the feet, the last phalanges of the fingers and toes, and the penis. They can be divided into three classes: first, long hairs, those of the scalp, beard, pubes, and axillæ; second, short, strong hairs, including those of the eyebrows and eyelids; and third, fine soft lanugo

hairs, covering the face, trunk, and other regions of the body.

The **main mass** or **cortical substance** of the hair is composed of delicate, flat, fusiform, epidermal scales, which are firmly attached to each other. In the center of many hairs is the *medullary portion*, or marrow, consisting of medullary or embryonal corpuseles, often pigmented. In con-

sequence of the varying amount of granules and diffuse pigment found both within and between the scales, hairs greatly differ in color. Gray and blond hairs are without pigment granules. The amount of pigment is unquestionably closely connected with the general nutrition of the skin, and under control of the so-called trophic nerves, as proved by the rapid turning gray of the hair in exhaustive diseases and after mental emotions. On being pulled out, the hair shows minute air-bubbles in its substance.

The shape of the hair is best studied in transverse sections (Fig. 12). Flat hairs exhibit, as a rule, a circular or oblong section, while in curled hairs this is elliptical or uniform.

The **hair-follicle**, in which the root of the hair is imbedded, is a pouch-like, connective-tissue structure, with interspersed circular muscle-spindles, in connection with those of the arrector pili muscle. It is a formation of the derma made up of parallel bundles, and passes in an oblique direction through the cutis into the subcutaneous tissue, where it terminates in the papilla of the hair, corresponding to the bulb of the latter.

The hair-follicle is usually described as consisting of three layers, the external, middle, and internal. The external and middle—also called external and internal fibrous coats by Kölliker—consist of connective-tissue fibers, the former containing an artery, vein, and nerves, the latter only an artery and

vein; the internal sheath, vitreous, structureless, or basement membrane, is perfectly homogeneous on vertical section, and does not contain vessels or nerves. The outer and middle layers may, however, be considered as one, while the internal is taken to be the homogeneous or basement membrane between the follicle and outer root sheath. At the bottom of the hair-follicle, according to Wertheim, a longitudinal tract of fibrous connective tissue is often found, which runs in the direction of the hair and carries the blood-vessels.

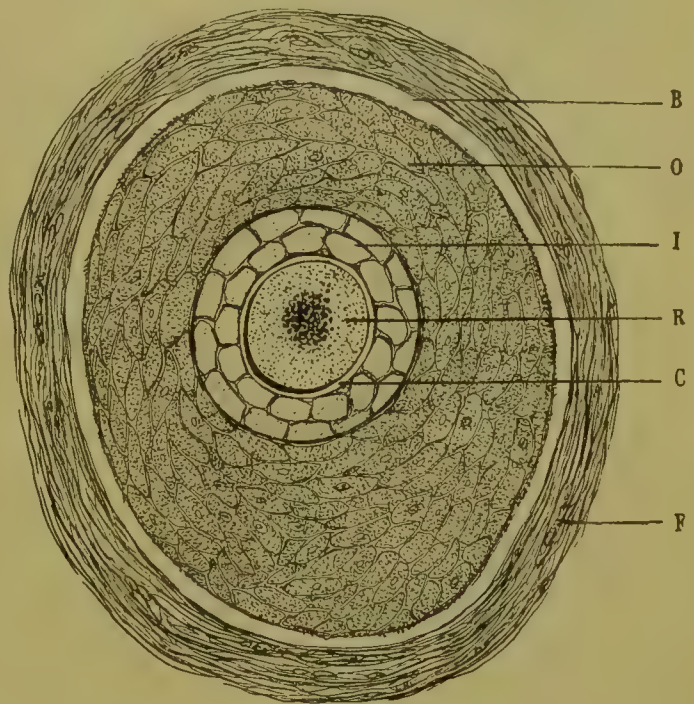


FIG. 12.—The root of the hair and its sheaths, in transverse section. Magnified 500 diameters.

R, root of hair; C, cuticle of hair; I, inner root-sheath; O, outer root-sheath; B, basement membrane; F, follicle.

The **papilla of the hair** is composed of a delicate fibrous or myxomatous connective tissue, freely supplied with spindle-shaped, protoplasmic bodies, and holding a number of blood-vessels which produce at its top a loop similar to that in the papilla on the surface of the derma. It is surrounded by a concave excavation of the bulb of the hair.

Within the hair-follicle the external and internal root-sheaths and the hair proper are found.

The **outer root-sheath** is an offshoot of the rete mucosum, consisting of epithelia similar to the latter. It becomes thinner the farther down it extends, and finally perishes near the bulb of the hair. This sheath produces an epithelial pouch—the sebaceous gland.

The **inner root-sheath** is composed of two layers, the sheath of Henle and the sheath of Huxley. The outer portion shows the light, horny Henle's layer, which consists of pale and finely granular polyhedral epithelia, with indistinct nuclei; more internally, the epithelia are coarsely granular and slightly elongated; this is Huxley's layer. At the bottom of the pouch this layer turns over, surrounds the papilla, and constitutes a broadened knob, the *bulb* of the root of the hair. The hair, according to C. Heitzmann, is a solid elongation of the inner root-sheath, and produced by this sheath alone. The outer root-sheath has nothing to do with the formation of the hair. The boundary line between the outer and the inner root-sheath is marked by the presence of a so-called structureless or cuticular membrane. Between the inner root-sheath and the root of the hair there is a thin, apparently structureless layer, outside of which is the inner root-sheath, inside the cuticle of the hair.

The **cuticle** on the upper portion of the root as well as on the shaft is composed of thin, imbricated scales whose edges are slightly elevated above the surface of the hair, and furnish the latter with the peculiar serrated appearance. Gradually the epithelia of the cuticle of the root assume a columnar shape and become nucleated, being large with distinct nuclei at the height of the bulb. The middle portion of the bulb is often filled with globular, indifferent, or medullary corpuscles, which hold a varying amount of pigment, and fill also the central portion of the root, the so-called medullary space; the latter even in strong hairs is not always present.

The **shaft** of the hair has the same structure as the root, but possesses no inner root-sheath.

The new formation of hair (Fig. 13) takes place around the papilla from the bulb of the previous hair. Every hair has only a limited existence under normal conditions. In the process of shedding, the old hair is pushed outward by the young one, which latter starts from the medullary tissue composing the center of the bulb. Originally, both the young and the old hair remain connected; the bottom of the latter, however,

soon splits up into a brushlike knob, made up of epidermal spindles, *the fringed knob of Henle*. The outer root-sheath and the follicle remain unchanged, the follicle being contracted around the young hair, probably due, according to Biesiadecki, to the contraction of its circular muscle-fibers.

The new growth of hair then takes place exclusively within the inner root-sheath. The latter, at the height of the bulb of the old hair, becomes gradually widened. At the bottom of the pouch it turns upon itself and produces the bulb which, in its central portion, is composed of medullary, indifferent, or embryonal corpuscles. The boundary between the two portions of the inner root-sheath is established by the cuticle; this, at the height of the bulb of the old hair, is composed of columnar epithelia. The pigment, if present, lies exclusively in the central portion of the inner root sheath, from which arises the future hair.

Development.—The beginning of the development of the hair takes place about the end of the third month of intra-uterine life, with a solid cylindrical outgrowth from the rete mucosum. The epithelial investment of the skin at first produces a knoblike prolongation downward, while later an extension of the connective tissue is formed, which lifts the bottom of the epithelial knob and produces the papilla. The epithelia are originally all medullary in character, and from the medullary corpuscles, by elongation and mutual flattening, arise the elements composing the hair in the center of the knob, and also the root-sheaths at its peripheral portion. As growth and elongation of the epithelia proceed, the new hair, with its pointed end, gradually reaches the outer surface. It does not at once penetrate the surface, but remains in the horny layer of the epidermis for some time, till in the sixth month of foetal life it grows out to the free surface.

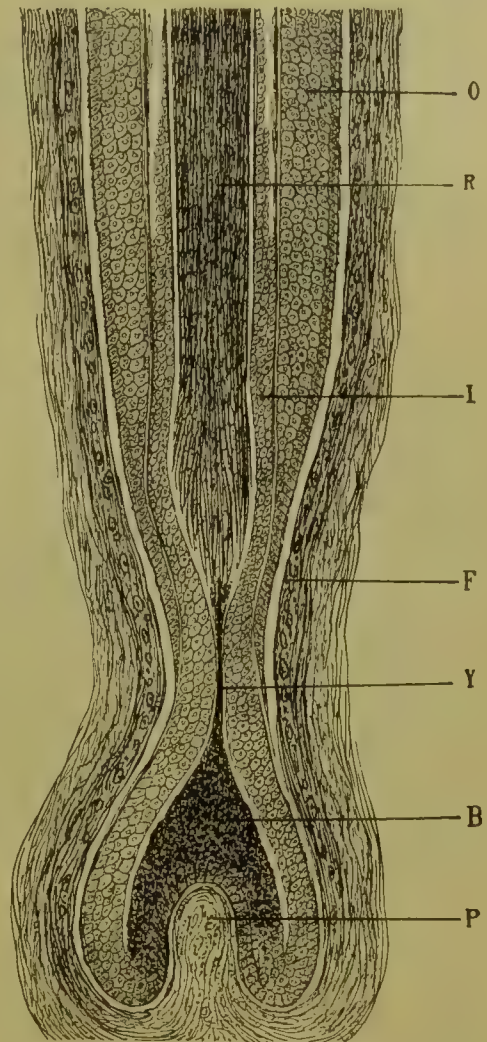


FIG. 13.—Shedding of the hair. Magnified 100 diameters.
P, papilla of hair; B, bulb of root; Y, young hair, growing from bulb; R, root of old hair, split up at its lower end; I, inner root-sheath; O, outer root-sheath; F, follicle with smooth muscle-fibers.

Nails.—The nails (*ungues*) (Fig. 14) are horny, elastic, transparent, flattened, platelike formations, which are imbedded in the skin upon the dorsum of the phalanges of the fingers and toes. They are merely modifications of the epidermis, and differ from the horny layer only in being harder and firmer. They have four borders, only one of which, the anterior, being free, the posterior and lateral being situated in the skin, and are slightly curved in their long diameter, with an upper convex, and a lower concave surface.

Each nail is divided into a *body* and a *root*. The body is the nail proper, and is fixed on to the *nail bed*, while the nail root is fixed on the

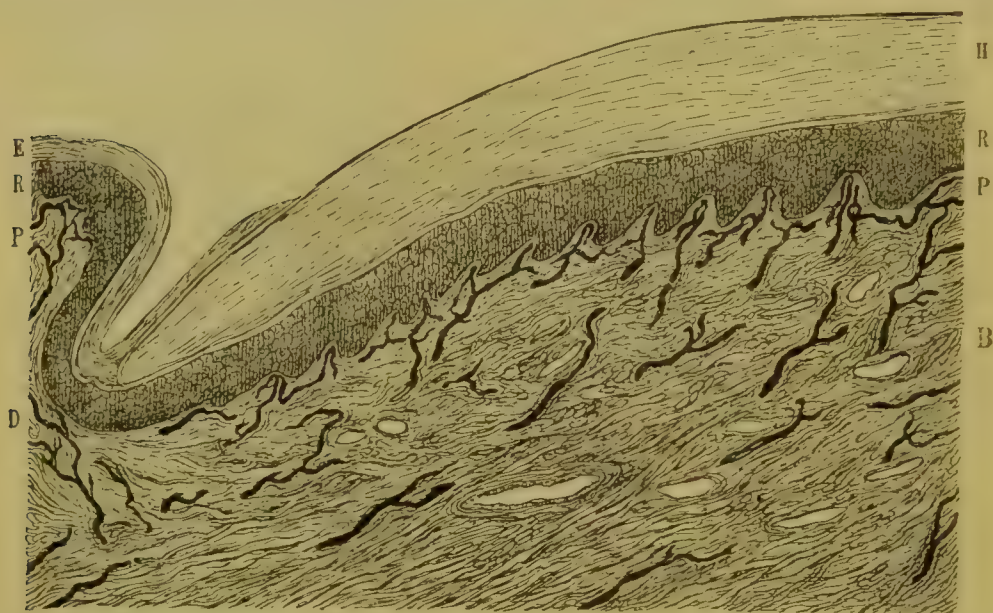


FIG. 14.—Nail; longitudinal section. Magnified 100 diameters.

H, horny layer of nail; R, R, rete mucosum; P, P, papillary layer; B, bed of nail, blending with periosteum; E, epidermis; D, derma with injected blood-vessels.

nail matrix—that is, the posterior part of the nail bed. The nail is inserted with its posterior and the greater part of its lateral margin in the *nail groove*, a fold by which the nail matrix passes into the surrounding skin. The matrix and bed of the nail proper are separated by a more or less convex line, seen through the nail, and called the *lunula*, which is most distinct on the thumb. The nail bed is formed of the subcutaneous tissue, corium, and rete mucosum.

The papillary layer of the skin subjacent to the nail is highly developed, the papillæ being arranged in parallel rows corresponding to the long axes of the fingers and toes. In the region of the matrix the papillæ are shallow, but increase in size toward the free portion of the nail, especially toward its lateral borders. The derma forming the papillæ is composed of coarse, dense fibrous bundles, inclosing a comparatively small number of fat-globules, and blending with the periosteum of the

last phalanx. The vascular supply is quite large. The derma is covered by an epithelial layer identical with that of the rete mucosum, and filling the valleys between the papillæ in such a manner that the upper boundary of the rete mucosum exhibits only a fluted contour. The lunula of the nail is, according to Toldt, caused by a lessened transparency of the nail, due to the rete mucosum producing in this situation a broad layer of a uniform distribution. The rows of the papillæ are much less developed in the region of the lunula than in the rest of the matrix.

The nail substance consists of horny epithelia, of which the lower ones exhibit indistinct nuclei, while the outermost resemble epidermal scales. In the region of the root a gradual transformation from the epithelia of the rete mucosum into the horny epithelia takes place.

Recent experiments by Moleschott give interesting data in regard to the *growth of the nails*. He made experiments on his own person, and arrived at the following conclusions: 1. The nails of the feet grow slower than those of the hands—only about three fourths as much. 2. In warm weather the amount of nail formed is, as a general rule, more than in cold weather, though this difference in the growth is confined almost exclusively to the right hand, and is pronounced in a much less degree on the left hand. 3. In early manhood more nail is formed than in later years, though this decrease does not take place in old age. 4. Hands and feet together produce about 9.2 milligrammes of nail in twenty-four hours, which is equal to 3.43 grammes (almost one drachm) per year.

The **formation** of the nail commences in the third month of intra-uterine life, with a protuberance of the skin consisting of two or three rows of epithelia similar to those of the rete mucosum. In the fourth month one or two new layers of nucleated epithelia appear between the first, and those afterward form the horny epithelia of the nail. At this stage the nail is covered by the horny layer. By the end of the sixth month the nail margin breaks through the stratum corneum, and by the seventh or eighth month the greater part of the nail has developed. According to Bowen, the nail is a modified portion of the stratum lucidum, and becomes exposed by the loss of the epitrichial layer.

II. PHYSIOLOGY.

The physiological functions of the skin are of almost as great importance as its anatomical relations for a proper appreciation of the diseases which may affect it.

The skin serves, first, for the protection of the deeper tissues; second, as a sensitive organ; third, for the regulation of the temperature of the body; fourth, as an important organ for secretion and excretion, including perspiration; and fifth, for absorption.

1. *In the protection of the general surface of the body* all three layers of the skin—epidermis, cutis, and subcutaneous tissue—take part in an equal degree. The subcutaneous tissue, especially on account of its adipose layer, is well adapted for the protection of the underlying structures, muscles, nerves, and blood-vessels, from external injuries, such as pressure and blows. The cutis protects through its firmness, high elasticity, and flexibility. The thickness of the epidermis and the great insensibility and impenetrability of the horny layer prevent the bad effects of high and low temperatures and of many caustic and poisonous liquids.

2. *The skin is the chief organ for general sensation as well as for the sense of touch.* Its whole surface is extremely sensitive; its tactile properties are due more especially to the abundant papillæ with which it is studded, or rather to the sensory nerves with the tactile corpuscles in the papillæ. The sensation of touch varies greatly in intensity, and may be felt as mere pressure, as pain in all its varieties, such as burning, itching, pricking, or tickling, also in the perception of different temperatures. The intensity of the general sensation differs in different localities; it is most pronounced in places where the skin is thin, least where the thickness of the epidermis is great, as over the heels. In places where the papillæ are numerous and highly vascular, and sensory nerves, together with tactile corpuscles, are present in great numbers, such as the tips of the fingers, sensation is most pronounced. The size, form, and other characters of bodies are made known through the sense of touch.

The skin has a separate nerve apparatus for heat, for cold, and for pressure. Whereas it was previously supposed that the sensations of temperature and pressure were caused by the same nerves, recent experiments by Blix and Goldscheider, made independently of each other, have shown that the same irritation, applied to different parts of the skin, will cause different sensations. On some places the application of the electrode would cause only a sensation of pressure, on others a sensation of cold, and on still others one of heat. The sensation, therefore, does not depend on the kind of irritation, but on the specific property of the nerve-endings or the nerve-fibers themselves. According to Goldscheider, the thickness of the epidermis does not influence the degree of sensibility to temperatures to any considerable extent, since on some places, where the epidermis is thin, the sensibility is very great, on others only slight; on the eyelids, for example, it is well pronounced; on the penis, on the other hand, only slightly so. The last-named observer has also shown that two distinct kinds of sensitive nerves exist for the sensation of touch. The tactile corpuscles do not seem to have much significance in the perception of touch, but merely to act as a protective organ to the nerve-endings.

3. *The skin also plays an important part in the regulation of the temperature of the body,* controlling the heat of the blood. The loss of heat

from the body through the skin is probably seventy or eighty per cent of the whole amount, and takes place by radiation, conduction, and evaporation from the skin. The horny layer of the epidermis is a bad conductor of heat, and thus prevents a too great loss of heat from the superficial blood-vessels. The epidermis also exercises a pressure upon the rete mucosum and capillary blood-vessels, preventing their overfilling and loss of heat and fluid.

The influence which directly determines the quantity of blood in the skin is the power of the vaso-motor nerves to cause a greater or less tension of the muscular element in the walls of the vessels, and consequently a lessening or increase in the caliber of the vessel, accompanied by a less or greater current of blood. A warm or hot atmosphere so acts on the nerve-fibers of the skin as to lead them to cause a relaxation of the muscular fibers of the blood-vessels, and, as a result, the skin becomes full-blooded, hot, and sweating, the heat being carried off by the water. With a low temperature, on the other hand, the blood-vessels shrink, and, in accordance with the consequently diminished blood supply, the skin becomes pale, cold, and dry, the amount of heat given off being thus greatly lessened.

4. *The sebaceous and sudoriparous glands furnish the secretory and excretory products of the skin.* The secretion of the sebaceous glands, known as *sebum*, or sebaceous matter, is a semifluid, oily mass, and consists of cast-off epithelia with nuclei and granules, fat-globules, *débris*, and cholesterin crystals. The chemical composition of this secretion has not yet been definitely determined, but has been found to consist of palmatin, olein, saponified fats, cholesterin, a caseinlike albuminoid body, and inorganic salts, such as phosphates and chlorides. Its purpose seems to be that of keeping the skin soft and pliable, and by its oily nature of both hindering the too rapid evaporation from the cutaneous surface, and guarding the skin from the effects of the long-continued action of moisture; it also serves as a protection against external infection.

The amount of secretion varies greatly in different persons, and depends upon the size and functional activity of the glands. The process consists in the epithelia of the sebaceous glands undergoing a fatty degeneration; they gradually become filled with fat, till finally the epithelia rupture and expel their contents. The peripheral epithelia contain only a few fat-globules, the amount of which increases toward the center. The evacuation of the sebaceous glands is undoubtedly affected by the contraction of the arrector pili muscle around the hair-follicle. The fatty mass is, as a rule, first squeezed into the funnel of the hair-pouch, and only from large glands directly to the surface. The nerves have no influence in the production of sebum.

The secretion of the sudoriparous glands—sweat or perspiration—is a

colorless, slightly turbid fluid, either alkaline, neutral, or acid in reaction ; it is of a saltish taste, and has a peculiar odor, due to the presence of organic acids. Its reaction is in reality still unsettled. In a warm bath Luchsinger has found it to be at first acid, soon changing to alkaline, and remaining so. Under certain pathological conditions it is strongly acid. After the use of diaphoretics, such as pilocarpine or muscarin, it is neutral or alkaline. The composition of sweat also is not yet definitely determined upon ; it consists of 98 to 99½ per cent of water, organic acids, such as formic, acetic, butyric, propionic, caproic, and caprylic, salts, chiefly chloride of sodium, some phosphates and carbonates, neutral fats and cholesterin, extractive matters, and urea. Creatinin and sulphur have also been found in it. Urea is always present in small amount, and is usually increased in pathological conditions of the kidney.

Under ordinary conditions the sweat is formed so gradually that the watery vapor of it evaporates as fast as it reaches the surface. But during active exercise, exposure to great heat, in certain diseases, after the taking of diaphoretic medicines, and in all conditions where evaporation is prevented, it collects on the skin in the form of drops of fluid. The former is called *insensible*, the latter *sensible*, perspiration. The quantity of watery vapor excreted from the skin during twenty-four hours is, according to Seguin, between one and a half and two pounds. The amount of carbonic acid exhaled by the skin is only between one and three drachms daily.

Any increase in the amount of sweat secreted is usually accompanied by dilatation of the capillary blood-vessels. The secretion of sweat depends upon a nervous influence, and is probably under the direct action of a special nervous apparatus, in that various nerves contain fibers, which act directly upon the epithelia of the sweat-glands. The local apparatus is under control of the central nervous system, sweat centers existing probably both in the spinal cord and medulla. The nerve-fibers, which induce sweating, may act independently of the vaso-motor fibers, and this explains the fact that sweat occurs not only when the skin is red, but also when it is pale and the cutaneous circulation languid. Toward approaching death the perspiration often becomes inspissated, covering the skin with a viscid layer ; this is obviously due to the bursting of a large number of epithelia in the sudoriparous tube, whereby the disintegrated protoplasm renders the perspiration more consistent, of an almost mucous character.

5. *Absorption* is another important function of the skin, by means of which a large variety of substances can be taken up from the outside and carried into the general circulation. All gases, poisonous as well as non-poisonous, can easily penetrate the skin. A large number of medical substances, when rubbed into the skin, will exert the same effect, only

to a less extent, which they do when taken internally. An excellent example of this is shown in mercury, which, when applied in syphilitic affections, will exert its specific effect, and when carried to excess will cause salivation in the same manner as when taken internally. Auspitz has experimentally proved the penetration of small mercurial particles into the hair-pouch, the sebaceous and sudoriparous glands. Tar, iodine, naphthol, arsenic, and especially oily substances, are undoubtedly absorbed. Arsenic has caused poisoning in a number of cases, as also has the external application of cocaine. Vegetable matters, if soluble, or already in solution, give rise to their peculiar effects, as also cathartics, narcotics, and the like, when rubbed into the skin. Substances dissolved in chloroform, ether, or alcohol, easily penetrate the skin.

It has recently also been demonstrated that certain bacteria may be absorbed by the skin; furuncles, for instance, have undoubtedly been caused by rubbing into the perfectly intact skin cultures of the *staphylococcus pyogenes aureus*. That simple contact, without pressure and rubbing, is, at least in most cases, perfectly harmless, need hardly be mentioned. The effect of rubbing is probably to convey the particles into the follicles of the hairs and the orifices of the glands, whose walls are covered only by a single layer of epithelia, and thus they easily become absorbed. Quite recently Wasmuth has made experiments with different bacteria, and has found that the sebaceous and the sweat glands do not carry the infection, but that the bacteria enter the skin in the space between the hair-shaft and the sheaths. In places where the epidermis is thick, absorption will hardly take place, though even here certain substances may penetrate some distance.

SEMEIOLOGY.

By PRINCE A. MORROW, M. D.

THE symptoms of skin diseases are commonly classed as objective and subjective, the former term being applied to structural alterations in the skin which are appreciable to the sight and touch of the observer, while the latter is employed to designate disorders of sensation which come only under the immediate cognizance of the patient, and which may be revealed by no outward sign.

In many cases, however, the symptoms are not limited to the skin itself, but involve other organs, or even the entire economy. In view of the importance of the functions of the skin and their close physiological relationship with the functional activity of other organs of the body, it is not surprising that diseases of this organ should be so frequently associated with disturbances of the general health. The skin affection may stand in the relation of either the cause or the consequence of the general trouble. In many cases the skin disease is the primary event, and the systemic disturbance is secondary; in quite a proportion of cases, however, it may be regarded as a local expression of some constitutional disorder, or merely symptomatic of some internal organic affection. Diseases of the stomach, liver, kidneys, the genito-urinary apparatus, affections of the nervous system, and various diathetic conditions, may be reflected upon the cutaneous surface in the form of eruptive disturbance.

It is well, therefore, to recognize that, independent of the special symptomatology of skin disease, there may be present symptoms of a general nature which have an important bearing upon its etiology.

By many authorities an exclusive importance is assigned to the objective phenomena for diagnostic purposes. If the object were simply to recognize or name a particular disease, the signs visible upon the surface of the body are, as a rule, alone sufficient; but for the higher purpose of scientific therapeutics a knowledge of the nature and pathological relationship of the disease is necessary.

OBJECTIVE SYMPTOMS.

Under this head are included the various structural changes which occur in the skin and which are designated as elementary lesions. The

number of such lesions is comparatively limited, yet in their various forms, groupings, and modes of evolution they make up the numerous and wonderfully diversified clinical pictures of skin disease.

No other organ of the body is subject to so many and varied pathological alterations as the skin. This is explained by the extreme anatomical complexity of its structure and the fact of its exposure to a multiplicity of external causes of irritation.

A study of the anatomy of the skin shows that it is a composite structure, made up of a network of connective tissue, in which are imbedded a variety of glandular apparatus, with numerous plexuses of blood-vessels, lymphatics, and nerves. Each individual part is susceptible of originating or becoming the seat of morbid action, and the component parts are so closely juxtaposed and intimately related that a disorder of one entails more or less disturbance in the others, so that the entire structure of the skin may be involved in the morbid process. In the chapter on etiology we shall see that, in addition to the causes of disease which affect the skin in common with the general system, it is exposed, by virtue of its office as a protecting membrane, to the action of a vast number of external irritants of a chemical and mechanical nature, and of numerous parasites, each of which produces lesions of a typical but variable nature. The domain of cutaneous pathology is further extended by the close sympathetic relation existing between the nervous system and the skin. The skin is not only the receptive surface of all sensory modifications coming from without, but by its vasomotor and trophic innervation it becomes the principal medium through which are reflected disorders of the central nervous system from toxæmias and from functional and organic disorders of the viscera, and which are manifest in a variety of lesions.

Notwithstanding the immense diversity in the external aspect of the different dermatoses, they are each characterized by lesions of more or less definite anatomical form. It is well to bear in mind, however, that the same elementary lesion may be common to several diseases, and that a number of elementary lesions may appear in the same disease, developed at the same time or successively. It is rather the mode of evolution than the primitive form of the lesion which determines the essential character of the disease.

Since the objective characters of cutaneous eruptions serve as the basis for the recognition of a particular variety of skin disease or the differentiation of one variety from another, a knowledge of the appearance and nature of elementary lesions is of essential importance. They are commonly divided into primary and secondary lesions.

The primary elementary lesions are further subdivided into a number of classes: *macules*, *papules*, *wheals*, *tubercles*, *vesicles*, *bullæ*, *pustules*, and *scales*.

The secondary manifestations are classified as *excoriations*, *ulcerations*, *fissures*, *crusts*, and *cicatrices*.

PRIMARY LESIONS.

Macules.—Synonyms: *Maculæ*; *Taches*; *Flecke*.

Macules include every variety of discoloration level with the surface of the skin, and are of varying shape, size, and tint. They may be round, ovoid, or irregular, but generally have an approximately circular outline. Their size varies from a point scarcely larger than that of a pin to an area of several square inches, and their color may run through every shade from a delicate pink to a dark brown or black. They may disappear under pressure; may be of short duration or remain permanent; as a rule, they are not accompanied by subjective symptoms. According to their etiology, macules are classified as erythema, purpura, vascular nævi, and abnormalities of coloring.

Erythema arises from an acute congestion of the papillary vessels of the skin, disappears under pressure, and is of short duration. The color varies from a bright scarlet in arterial hyperæmia to bluish-red or cyanotic hue in venous distention. Erythema may be irregularly circumscribed in patches or generally diffused over the surface. When generalized and symmetrically developed it is symptomatic of a general disturbance of the system, as occurs in the eruptive fevers. *Roseola* is the name given to the variety which occurs as roundish or ovoid spots, from the size of a pea to that of a finger nail, in the course of the exanthemata. The erythematous ring which develops around an inflammatory lesion is known as an areola or halo.

Occasionally the erythematous spots may be slightly raised above the surface of the skin from inflammatory œdema, though, as a rule, the exudation from the blood-vessels is only in such quantity as can be absorbed by the cells of the different layers. When there is a slight escape of the coloring matter of the blood into the skin the patches are yellowish or yellowish-white.

Purpura is the name given to the extravasation of blood-corpuscles with their coloring matter, hæmoglobin, into the superficial layers of the skin. It is usually of a purple color, going through the various changes of shade seen in bruises as absorption takes place. Purpuric spots do not disappear under pressure, and are slow in evolution. When the extravasation occurs in streaks or lines they are called *vibices*; when in points, *petechiæ*; when in larger, more extended, irregular areas, *ecchymoses*.

Vascular Spots arise from dilatation of the small blood-vessels of the skin. They may be congenital, and are then termed *vascular nævi*; or they may be acquired, in which case the name *telangiectases* is given to them.

Abnormalities of Coloring are the result of an increase or decrease in the amount of pigment in the integument, and may be congenital or acquired, permanent or of short duration. The increase of pigmentation is sometimes secondary to previous disease, brownish stains remaining often after syphilides, lichen planus, urticaria, etc. Where large areas are discolored they are not spoken of as macules, but as discolorations of the skin. Where loss of pigment occurs it is known as vitiligo or leucoderma. In lentigo and chloasma there is an excess of pigment.

Discolorations or stains of the skin may also result from the use of certain chemicals, as dyes, or the accidental introduction of particles of pigment beneath the integument, as from the explosion of gunpowder.

Papules.—Synonyms: Papulæ; Pimples; Knötchen.

Papules are small solid elevations of the skin which contain no free fluid. Papules are produced by a variety of pathological processes; they vary in size, color, shape, consistency, the nature and seat of the exudation, and their transitory or persistent character. They are circumscribed in size, from that of a mustard seed to that of a pea. Their color varies from a bright pink to brown, purple, or yellow, according to their age and degree of vascularity. Their form is exceedingly diversified: they may be acuminate, as in papular eczema; conical or flat, in certain syphilides; angular, and also umbilicated, as in lichen planus; or their summits may be excoriated, as in papular urticaria and prurigo.

Inflammatory papules are caused by an exudation of serum into the superficial layers of the corium. In measles the exudation takes place in the papillæ around the hair-follicles, and is readily absorbed. The exudation may be more cellular and plastic, forming hard and persistent papules, as in lichen planus, prurigo, syphilis, etc.

The term is also applied to a variety of lesions non-inflammatory in character, to the retained secretions of the sebaceous glands, as observed in comedo and milium, to the heaped-up cornified sebaceous matter about the mouths of the sebaceous follicles, as in keratosis pilaris.

Papules ordinarily terminate by resolution. Their duration is exceedingly variable, depending upon the character of the exudation and the nature of the pathological process. Instead of disappearing, inflammatory papules may become converted into vesicles or pustules. Inflammatory papules are usually attended by itching.

Wheals.—Synonyms: Urticæ; Pomphi; Plaques ortiées; Quaddeln.

Wheals may be described as circumscribed lesions of variable shape and size caused by œdematous infiltration into the papillary layer of the corium. They are more or less solid and firm and do not readily pit on pressure. They are of a pale-pink color, sometimes with a white center

encircled by a pinkish areola. They are evanescent, appearing and disappearing with marvelous rapidity, generally leaving no trace behind. When discrete they are usually rounded or oval, but by coalescence they form large, flat, irregular patches. They are the result of angioneurotic irritation, which permits sudden exudation of serum; then follows a contraction of the vessels; this effectually prevents absorption until the spasm ceases, when resolution takes place with great rapidity. In one variety of urticaria (lichen urticatus) the exudation is accompanied with the formation of serous papules, which are more persistent. They are invariably accompanied by severe subjective symptoms, and are pathognomonic of urticaria.

Tubercles.—Synonyms: Tuberculæ; Nodules; Knoten.

The term tubercle is applied to solid circumscribed elevations of the skin, of a size from a pea to a hazelnut. The term nodule is preferable, since tubercle may be confounded with the lesion characteristic of the tubercle bacillus, and since tumors may be included under its head. The distinction generally accepted between papule and tubercle is one of size; a more scientific differentiation is that the former is situated in the superficial layers of the skin, while the latter consists of a cellular infiltration into the deeper layers of the corium. Tubercle is more frequently employed by dermatologists to designate hypertrophic changes and morbid growths. Their evolution is slow, with less tendency than the papule to spontaneous resolution; their borders are sharply defined, and their tops generally flat. When of inflammatory origin they are of various shades of red; small tumors may be of any tint. Among the cutaneous diseases in which tubercles or nodules are found are leprosy, lupus, and syphilis.

Vesicles.—Synonyms: Vesiculæ; Vésicules; Bläschen.

Vesicles are small elevations of the epidermis, containing serous fluid. Inflammatory vesicles are caused by an exudation of serum, which separates and raises the outer layers of the epidermis from its attachment beneath. Instead of being inflammatory in origin, they may simply represent the retained secretion of the sweat glands, as in sudamina. They may be seated directly in the skin, as in herpes, or they may form at the apex of a papule, as in eczema. The coloration of vesicles varies according to their contents. The fluid may be clear or opalescent, from admixture of pus cells, or sanious, due to the presence of blood. Vesicles may be superficial, as in sudamina, or placed in the deep layers of the skin, as in hydrocystoma. Generally the contents fill the vesicles, rendering them tense, but, when very large, they are apt to be flaccid. Vesicles are usually of short duration, disappear by reabsorption of their serum, by desiccation, or by rupture, the contents concreting in the form of crusts.

The vesicles of herpes and sudamina usually undergo involution without rupture, while in eczema the converse is the rule. When discrete, they are roundish or hemispherical, with convex tops or umbilicated in the center, as in varicella. They are unilocular in most cases; multilocular in variola. They may coalesce into patches, group themselves in various ways, are generally seated on an inflammatory base, and are attended by itching or burning. Their duration is usually short; successive crops may appear; they undergo resolution or become blebs or pustules.

Bullæ.—Synonyms: Blebs; Bulles; Blasen.

Bullæ may be defined as vesicles of larger dimensions. A bulla may be formed by the confluence of vesicles, it may develop directly from an erythematous base, or it may be a secondary process, as in erysipelas. In pemphigus bullæ develop from a healthy or noninflammatory base. They are round, oval, hemispherical, or irregular, from the coalescence of a number of lesions. The individual bullæ vary in size from that of a large pea to that of a pigeon's egg or even larger; when confluent they may form blebs of enormous extent. Their contents are the same as found in vesicles, and they terminate in the same way—by resorption, rupture, or suppuration. Bullæ are tense or flaccid according to the quantity of the effused fluid, and are unilocular in formation, so that their contents escape by a single puncture. When they disappear, crusts, formed by drying of the contents, are often left. These vary in color with the nature of the inclosed fluid, shading from yellow into black. They are not accompanied by such severe secondary manifestations as vesicles or papules. They occur commonly in erythema bullosum, various dermatites, pemphigus, etc.

Pustules.—Synonyms: Pustulæ; Pusteln.

A pustule may be defined as a vesicle with purulent contents. It may originate as a pustule or develop from a papule or vesicle. The pustular metamorphosis may be so rapid that the primary papular or vesicular form is not recognized.

According to their anatomical seat, they have been classed as *superficial epidemic pustules* and *deep intradermic pustules*. The former undergo rapid involution and leave no cicatricial trace; the latter may be characterized by destruction of tissue and leave permanent scars. They are yellow in color, or brown, brownish red, and purple, from admixture of blood. They may be acuminate, rounded, flat, or umbilicated. They terminate, as a rule, by rupture or desiccation, leaving dark crusts behind, as in eczema, scabies, herpes, impetigo, etc. The pustules of acne represent an inflammation, deeply seated, around the sebaceous and hair follicles. They are often surrounded by an inflammatory areola. In the pock or pustule of variola the exudation, instead of occupying an artifi-

cial cavity, takes place within the cells, distending the cell walls and forming a network infiltrated with fluid. It is multilocular, and its contents can not be evacuated by a single puncture.

The dermatoses, in which pustulation is the principal feature, are acne, impetigo, ecthyma, folliculitis, variola, etc. The evolution of pustules, especially about the hair-follicles, may be attended by considerable pain.

Scales.—Synonyms: Squamæ; Squames; Schuppen.

Scales are dry lamellæ, exfoliated from the surface of the skin, the product of desquamation of the epidermis, usually from inflammatory overgrowth of the cuticle without exudation.

Scales may be primary, constituting the chief feature of the morbid process (psoriasis, ichthyosis), or represent the secondary results of a previous inflammation (as in general exfoliative dermatitis, eczema, scarlet fever). Their variation, as to size, shape, and thickness, runs through a wide range. The desquamation is said to be furfuraceous or branny when it occurs in fine, small scales. The scales of seborrhœa consist of small masses of sebaceous matter and epithelial cells.

Lamellæ is the name employed when the size is that of a finger nail or larger. The scales are silvery in psoriasis, white in pityriasis rubra, dirty yellow in eczema seborrhoicum. They appear in single layers in squamous eczema, or are piled up into crusts in psoriasis. The quantity shed per diem in dermatitis exfoliativa may be considerable.

SECONDARY LESIONS.

Excoriations.—Synonyms: Excoriationes; Hautabschürfungen.

Excoriations are solutions of continuity, of variable form and extent, involving ordinarily the superficial layer of the epidermis and marked by a superficial redness. The loss of substance may extend more deeply, exposing the true skin, in which case there is usually an exudation of blood-corpuscles with the serous fluid drying into brownish crusts. The method of production is responsible for the size, shape, and depth, and, aside from mechanical injury, scratching is the most frequent cause. Pruriginous diseases, therefore, exhibit excoriations in the greatest number. The grouping, extent, and location of the scratch marks is of diagnostic value in a number of affections. The excoriation may be surrounded by a pinkish inflammatory areola, may be scabbed over by a slight crust, or, in urticaria, may be followed by a wheal. They occur in points in the papular diseases, or in lines in pediculosis. The minute blood crusts upon the torn summits of eczema and prurigo papules and the linear excoriations caused by the nails in phtheiriasis are quite characteristic. The lesions are found in the lichens, prurigo, urticaria, eczema, etc.

Fissures.—Synonyms: Rhagades; Rhagaden; Hautschründe.

Fissures are linear lesions, involving the epidermis and the upper layers of the corium; the rents, instead of being superficial, may penetrate deeply into the substance of the corium. They are the result of injury or disease, and are found almost always where the epidermis is thickened, horny, and inelastic. Fissures are in consequence most often found in the palms, soles, especially between the fingers and toes, and flexures of the joints, along the natural lines, and at the corners of the natural orifices. They are painful when put on stretch, do not produce scars in healing, and generally do not secrete.

When the epidermis is thickened and infiltrated, and its nutrition impaired by any chronic inflammatory process, it loses its normal suppleness and cracks and fissures are liable to occur.

Eczema, from the thickening it produces, is the chief etiological factor in their production. Fissures are common about the mouth in congenital syphilis.

Ulcerations.—Synonyms: Ulcera; Ulcers; Ulcères; Geschwüre.

Ulcerations are losses of substance extending to the deeper layers of the corium and even the subcutaneous tissue, and due to some pathological process. Ulcers may result from impaired nutrition of parts, from suppurative inflammation, and from a retrograde metamorphosis of cell infiltration, as in lupus, leprosy, and other neoplasms. They differ from excoriations not only in depth but in extent of surface, and the loss of substance is replaced by cicatricial tissue. Their size is practically unlimited; their depth is great or small; their edges, sharply cut, as though punched out, everted or undermined; their bases, smooth or irregular, clean or covered with a slough, bathed in pus or serum. They are often exquisitely sensitive. The discharge from them may be free from odor or horribly offensive. They become covered with crusts in many instances if undisturbed, and have, except in malignant growths, a tendency to spontaneous healing, but always with the formation of a cicatrix. Varicose veins in the lower extremity perhaps stand first in the production of ulcers. Ulcers have an important significance, from a diagnostic point of view, in their seat, shape, and depth, and in the characters of their edges and base.

Crusts.—Synonyms: Crustæ; Croûtes; Krusten.

Crusts are concretions of matter, of more or less hardness, due to the drying of serum, blood, or pus on the surface of the skin. The term is also sometimes applied to the condensation and drying of the sebaceous secretions which may be intermingled with serum. They are more or less adherent to the subjacent tissues, depending on the quality

of the exudation, and, when removed, leave ulceration or cicatrization. They vary greatly in thickness, color, and size; they are thin and yellow in eczema and impetigo; sulphur-colored and cup-shaped in favus; dark or reddish-brown in ecthyma; grayish-black or green, irregular, and laminated, like the shell of a crustacean, in rupia syphilitica. When they are flat and shaped like a coin they are called *nummular*. The crusts of seborrhoea are greasy and yellowish, composed of fat and epithelium, and may be rolled up like a ball between the fingers. When they are the result of drying of serous exudation, and when the parent lesion is superficial, they are apt to be thin and yellow; when they appear consecutive to pus formation and the lesion is deep-seated they are oftenest thick and dark.

Cicatrices.—Synonyms: Scars; Narben.

A scar is a formation of new tissue, chiefly fibrous, replacing a loss of substance which extended into the derma. The new formations represent a lower organization than the loss of substance they replace; they are covered by an epithelial layer; the higher developments of the cutaneous elements, glands, hair-follicles, papillæ, are absent, but nerves and vessels may be present. Scars are atrophic or hypertrophic. In the first case they are white, smooth, glistening, and are not necessarily the result of ulceration, often resulting from the involution of infiltrations, as in lupus. In the latter class they are ordinarily the result of deep ulceration, as in burns and other traumatisms. The connective tissue, instead of being spread out in a uniform layer, may be developed in excessive quantity and form ridgelike prominences or clawlike processes, as seen in false keloid. Cicatrices are white because of the destruction of the pigment layer and the defective blood supply; smooth because deprived of papillæ and follicular structures, and often depressed from loss of substance. Scars are of the greatest diagnostic importance, retrospectively.

SPECIAL LESIONS.

A few lesions, which can not properly be classed under any of these heads, such as the cuniculi or furrows produced in the skin by the acarus scabei, the sulphur-colored crusts of favus, cutaneous horns, etc., are encountered in certain special disorders. They will be fully described under the diseases in which they occur.

GENERAL SYMPTOMS.

The elementary lesions are often gathered together into groups or separate areas of disease, which are termed patches, and the lesions and patches, taken collectively, constitute the general eruption. The eruptive elements are not by any means limited to one type of lesion at any given

time. The combinations possible are almost infinite; papules may occur with pustules, vesicles with erythema, tubercles with ulcerations or crusts, when the eruption is spoken of as papulo-pustular, erythemato-vesicular, tuberculo-crustaceous, etc.

Distribution and Grouping of the Patches.—The disposition of the individual lesions in the patches appears to follow certain laws which are as yet not clearly understood. The form of the lesions has been found to follow the globular areas of distribution of the vascular supply, and represents figures as circles, segments of circles, ellipses, etc. The arrangement of the groups of lesions follows the “lines of cleavage” of the skin. These lines, the position and direction of which may be easily demonstrated, are the result of the arrangement of the bundles of connective-tissue fibers. The distribution of the blood-vessels in and beneath the integument, creating conditions of tension of the skin and subcutaneous tissues, is largely dependent upon the lines of cleavage. Moreover, the vasomotor centers located in the cord, which preside over well-defined vascular areas, have a determining influence in the distribution of the elements of the rash.

Certain qualifying terms are used in the description of the manifestations of cutaneous diseases which relate to their size, shape, arrangement, grouping, and mode of evolution.

Lesions are spoken of as *punctate* when occurring in dots or points; *guttate* when of the size of a drop of water; *nummular* when of the size of small coins. Small lesions the size of a millet-seed are termed *miliary*; of the size of a small bean or pea, *lenticular*. They are said to be *acuminate* when they have a pointed aspect; *plane* when flat; *umbilicated* when they have a depressed center. When individual lesions are separate they are said to be *discrete*; when in close proximity and coalescing, *confluent*.

Patches, or the lesions composing them, when arranged in crescentic outline forming circles or segments of circles, are said to be *circinate*; when in the form of rings, *annulate*; when the circles or rings coalesce they are broken at the point of contact and the term *figurate* or *gyrate* is applied. *Iris* is the term applied to lesions whose appearance is that of more or less defined concentric rings. A lesion or patch is *serpiginous* when advancing at one edge and clearing up at the other; when the border is clearly defined it is said to be *marginate*. When of limited extent and of sharply defined contour it is *circumscribed*; when spread over a larger surface and irregularly disposed it is said to be *diffuse*.

The term **eruption** is applied to the totality of all lesions and patches upon the person of one individual. Eruptions are classed as *universal* when spread over the entire surface of the body; *general* when the eruptive elements are distributed over the whole surface with areas of healthy

skin intervening. An eruption may be *localized*—limited to one or more regions; or *disseminate*—scattered irregularly over the body. It is said to be *uniform* when exhibiting lesions of but one type; *multiform* or *polymorphous* when several types of elementary lesions are simultaneously present. An eruption is termed *symmetrical* when disposed alike on both lateral halves of the body; *asymmetrical* when distributed differently on the two lateral halves; *unilateral* when confined to one side.

Many other terms are used to designate the regional distribution of the eruption, its etiological relations, and clinical characteristics which scarcely require definition.

SUBJECTIVE SYMPTOMS.

Subjective symptoms are of subordinate importance in dermatology as compared with the objective signs. They may be absent or present, and range in intensity from a mild itching in erythema to the excruciating pain due to ulcerated new growths of malignant character. A sense of heat, tingling, and burning is usually present in acute inflammatory conditions.

The element of pain is by no means a constant or even a common characteristic of skin diseases. Pain of a darting, neuralgic character usually precedes the development of herpes zoster. Pain is largely present in processes attended by pus formation—*e. g.*, furunculosis, and in deep ulcerations in certain localities. Pruritus is by far the most common and important of the subjective symptoms, and its presence or absence constitutes a valuable diagnostic sign. It may be tickling from the presence of parasites, tingling in urticaria, pricking and stinging in lichen tropicus, while in eczema and prurigo it may be of the most violent character. A variety of itching known as *formication* is described as a feeling of insects crawling over the skin. The complete absence of pruritus is of the utmost value in enabling us to differentiate syphilitic and nonsyphilitic skin diseases which have a close morphological resemblance.

ETIOLOGY AND DIAGNOSIS.

By WILLIAM A. HARDAWAY, M.D.

ETIOLOGY.

ETIOLOGY of diseases of the skin includes all those causes which have influence, directly or indirectly, in producing a morbid condition of the skin or of its appendages. Thus it will be seen that the etiology of affections of the skin must be studied with special reference to each one of its diseases, for in no two of them will the causes be precisely similar. Yet with advantage a general view of some of the common etiological factors may be taken.

For this purpose it is necessary to divide the etiological factors of skin diseases into classes. Since the days of Lorry all writers have recognized skin affections as falling into two general classes: those which are only part of a more or less general involvement of the organism (symptomatic skin diseases), and those which attack primarily and independently the skin (idiopathic skin diseases). In accordance with this universally recognized principle of nosology, we may divide the causes of skin diseases into, first, those causes which act more or less widely upon the organism, producing various affections of the skin only as a part of their effect; and, second, those causes which act essentially upon the skin.

CAUSES AFFECTING THE ENTIRE ECONOMY.

Eruptive Fevers.—Among those causes which affect the whole economy, while as a symptom of their presence the skin is nearly always involved, are to be mentioned the eruptive fevers, embracing measles, scarlet fever, r  theln, chicken pox, vaccinia, and smallpox. In these maladies the natural history points certainly to an involvement of the organism by an infectious agent, while the secondary involvement of the skin is so invariable as to constitute one of the chief evidences of the presence of the disease. The clinical fact that each one of these specific causes produces a characteristic lesion of the skin is of the utmost importance, though as yet we are unable to explain it. There is another class of infectious diseases which is usually accompanied by an eruption upon the skin, though this may vary much in its type even in the same disease;

such diseases are represented by syphilis, leprosy, typhoid fever, and typhus fever.

Nutritive Disturbances.—The skin is often injuriously influenced by changes in the general nutrition of the body. Thus the rheumatic diathesis is often accompanied by eczema or by hæmorrhages. Though to-day the teaching of Hardy and Bazin in regard to “*dartre* and herpeticism” can not be accepted, still we are obliged to admit the relation between gout and rheumatism and affections of the skin. If we accept the theory that gout is caused by an unusually large amount of uric acid circulating in the blood, we can understand how the various salts of this acid may at times be deposited in the skin, forming the well-known gouty concretions. So in eczema or hæmorrhage accompanying rheumatism, the skin lesions may be directly due to injurious substances in the circulation. In certain anæmic states and in scurvy hæmorrhages may occur, due perhaps to a general malnutrition in which the vessels participate. In anæmias there is usually a discoloration of the skin. With uræmia and glycosuria occur not only alterations of the secretions of the skin, but more severe lesions, such as carbuncle or gangrene.

Hereditary Peculiarities.—Certain diseases seem to depend upon some peculiarity in the constitution of persons which is handed down from parent to child. How far-reaching the influence of heredity may be, or where it ceases, we can not tell. That peculiarities of parents are transmitted to children is a matter of every-day experience; we see this in the color of the eyes and hair, the conformation of the features, and the size of the body. Some instances of morbid heredity we are able to explain by presuming that the living germ of disease is contributed by one or the other parent, along with the ovum or spermatozoön. Hereditary syphilis may be thus explained. Other hereditary diseases can not be thus explained; but it would seem that a faulty nutrition or a formative aberration is impressed upon the offspring. Ichthyosis seems to be hereditary in this sense. In still another class of cases no actual malady is transmitted, but there is stamped upon the child a peculiar vulnerability to certain diseases; thus, in some families, there are several generations who are very prone to eczema or psoriasis. In fact, we so often see eczema or psoriasis developing in persons who are not exposed to exciting causes different from those which affect others who escape, that we are forced to advance predisposition as a frequent factor in etiology.

Age, Sex, and Climate.—Among those causes which so act upon the constitution as to become in a general way factors in the production of skin diseases must be reckoned age, sex, and climate. It is not implied that these conditions are causes of disease in the same sense in which the other factors that we have been considering are, but rather that they serve as predisposing causes; they effect certain alterations in the constitution

which do not necessarily produce any disease, but without which some diseases can not develop. Thus we usually see prurigo and Kaposi's disease developing in young children; in old age senile pruritus and epithelioma are met with; lupus erythematosus most commonly attacks females. Climate seems in some way to exercise an influence in the production of skin diseases; thus prurigo is said to be more common in Austria than in England, while psoriasis is more frequent in the latter country. Leprosy is another malady which seems to have a predilection for certain climates. It must be admitted that our knowledge in regard to the effect of climate upon the production of skin diseases is not of a very definite sort; it is difficult to isolate this factor from others which are almost inextricably associated with it, such as advance in civilization, habits of life, race, etc.

White has formulated the following table as representing the relative frequency of dermatoses in America and Europe:

1. Prurigo, pellagra, and lichen ruber do not occur in America.*
2. Some diseases due to uncleanness, especially to animal parasites, are more infrequent in America than in Europe.
3. Some severe diseases which are associated with constitutional affections are more infrequent, or run a milder course, in America than in Europe, or other countries in which they are endemic (lupus, syphilis, and leprosy).
4. Certain diseases of the skin, especially of the glands, and those connected directly with the nervous system, are more frequent in America than in Europe (seborrhœa, acne, perhaps also eruptions from heat, herpes, urticaria, and pruritus).

Secondary Affections.—Symptomatic dermatoses are very often to be remarked associated with various affections of single organs or anatomical systems. It is well known that cancer of any part will often cause a discoloration of the skin. The staining of the integument which occurs in Addison's disease, and many affections of the liver, constitutes the most striking sign of these diseases. Hyperpigmentation seems often to follow derangements of the female genital apparatus. Abnormalities of sensation, as itching, may be present in diseases of the liver or kidneys, or may depend on a disorder of the nervous system. Hyperæsthesia, anæsthesia, paræsthesia, etc., may occur with traumatism or disease of the nerve trunks or centers. Œdema of the skin is generally associated with lesions of the heart, kidneys, or lungs; at times it is dependent upon a functional disturbance of vascular innervation, as in angio-neurotic œdema. Localized œdema may be caused by gastric disturbances, as is often the case in urticaria. Still more severe alterations of the skin occur with diseases of

* Observations made during the past few years show that the first and last mentioned affections in this group are by no means uncommon in America.

individual organs; it often happens that *acne vulgaris* is the direct result of indigestion, and many *eczemas* own a similar cause. *Acne rosacea* is very often caused by chronic gastric catarrh or chronic uterine affections. Anything which brings about long-standing obstruction to the circulation may produce telangiectases. Some cases of elephantiasis of the lower extremities are thought to be brought about in the same manner. *Pernio*, hæmorrhage, cyanosis, and gangrene may all be caused by a lesion of the heart. We have seen above that lesions of the nervous system can produce changes in the sensibility of the skin; and though as yet the subject is not so thoroughly investigated as one could wish, we have sufficient proof to show that some inflammatory and atrophic changes are due to morbid conditions of the central or peripheral nerves. After a traumatism of a peripheral nerve the condition known as glossy skin has been remarked. *Herpes zoster* is an inflammatory disease of nervous origin. *Decubitus* often develops so rapidly in paralysis as to be clearly due to a profound alteration in the trophic supply of the skin. The symmetrical gangrene of Raynaud seems certainly to be a trophoneurosis. The nervous element probably enters still further into the etiology of diseases of the skin; but a full consideration of all its possibilities is more fitting for discussion under special etiology than in this place.

Diet and Drugs.—Among those causes which act upon the organism in such a way as to produce eruptions upon the skin, certain foods and drugs must be mentioned. Among drugs which have this effect, quinine, chloral, iodide and bromide of potassium, copaiba, and belladonna are specially worthy of mention, though in some peculiarly susceptible persons almost any drug may provoke a dermatosis. The type of the eruption may vary from a simple erythema to a hæmorrhagic rash. Furthermore, the same drug does not always produce an eruption of the same type; thus quinine may in one person be followed by a simple erythema, and in another its use may provoke a petechial rash. As in a study of any part of etiology we are constantly struck by the susceptibility of some to a certain cause, while others equally exposed escape, so here these drugs are often ingested without causing any cutaneous disturbance; we are therefore obliged to bring in the factor of idiosyncrasy.

Among the foods most commonly acting in this way are to be mentioned certain sorts of fish, as lobsters and oysters; fruits, as bananas and berries; and many other articles of diet which are harmful in some cases, while in many others they are entirely innocuous. How to explain this prejudicial action, whether by the direct action of something contained in the blood taken up from the food, or whether by the reflex effect of digestive disturbances, we can not always tell.

Thus it appears that maladies of the skin often bear a close relation to affections which involve the general organism or single organs. As

important as this relation is, it was once regarded as far more extensive than we now know it to be. Since the days of Hebra, no intelligent physician believes in the myth of the psora, that morbid humor which lay at the basis of all skin eruptions. Perhaps the pendulum has swung in the opposite direction, and many are so busily seeking the local causes of skin diseases that their broader relations with general pathology are overlooked.

EXTERNAL CAUSES.

Far-reaching as the causes of skin diseases which lie in the organism itself are seen to be, a majority of all dermatoses owe their origin to some cause acting specially upon the skin and not bringing about any disturbance in other organs. The various factors making up the active agents in the etiology of idiopathic dermatoses are to be regarded as irritants which are applied to the cutaneous surface. The local causes of skin diseases may be of a chemical, mechanical, or parasitic form.

Chemical Irritants.—The chemical irritants which may in one way or another come into contact with the skin are wellnigh innumerable. Some are inseparable from our every-day existence, and therefore act on a large portion of mankind. Thus all are more or less exposed to the heat and the effect of the actinic rays of the sun, and we find dermatitis, pigment changes, and various other skin lesions thus developed. Many eczemas are caused by the use of strong soaps. A considerable number of plants are endowed with chemical substances which are deleterious to the human skin; among these are the poison oak, ivy, and sumac. Insects and reptiles often carry poisons which, when introduced into the skin, evoke dermatoses; mosquitoes, bees, and serpents afford familiar illustrations. Their attacks upon the skin may provoke lesions ranging all the way from wheals to severe phlegmons, and even gangrene. Inflammation may be set up by chemicals applied for this purpose, as when cantharis is used for its blistering effect; or the chemical may have been used for an entirely different purpose, and the inflammation be accidental, as, when iodoform is used as an antiseptic, a dermatitis of the surrounding skin is often caused. In many of the trades chemical agents are used which are capable of exciting inflammations of various grades. In those working in positions exposed to heat, dermatitis and pigment changes have often been noted. If a part be exposed to great cold, inflammation or even destruction of the skin may result. The application of the stronger alkalies, acids, and escharotics will produce dermatitis or necrosis.

Mechanical Irritants.—The mechanical irritants which may cause diseases of the skin are only numbered by the habits and employments of man. Those very means which are generally conducive to health, be-

come, when improperly or excessively used, etiological factors of disease. Thus, water improperly used is a common cause of eczema; the ordinary use of the muscles in exercise may, if the parts be not properly protected, result in excoriation; bruises, lacerations, and abrasions are the common results of mechanical forces acting too harshly upon the skin. Each one of the various callings is attended by its own special opportunities for the ill effects of mechanical irritants upon the skin. The shoemaker, who constantly hammers the last upon his thigh, gets in the course of time a thick callus in the irritated region; the bartender, who has his hands constantly in water, acquires an eczema; the laborer, with pick, shovel, or other instrument, produces clavi upon his hands; the grocer, the baker, the brick or stone mason, with hands and wrists always exposed to the irritating particles which he handles, develops an eczema. The catalogue might be indefinitely extended, but these illustrations suffice. Among mechanical causes of skin diseases must be reckoned improperly fitting dress. If a tight shoe be worn, corns appear to mark the sites of pressure; the scrotum is usually held in contact with the thigh by the trousers, and in warm weather, when the parts are constantly moist, an intertrigo follows; the development of varicose veins in the lower extremities may be favored by tight garters and the like.

Parasites.—A large number of diseases of the skin are the results of the presence of animal or vegetable parasites. The number of parasitic diseases is constantly increasing as our methods of investigation grow more exact. The number of animal parasites which produce skin diseases of one sort or another, though large, is not nearly so considerable as the number of vegetable parasites.

Animal Parasites.—Of the animal parasites, some flourish best in certain climates; thus the filaria and the Guinea worm are met with in the tropics. Some of the animal parasites reside permanently in or upon the skin, such as the acarus, filaria, echinococcus, etc.; while others, as the mosquito, pediculus corporis, bedbug, etc., only attack the skin at intervals for purposes of feeding. The lesions caused by such parasites vary from transient wheals to permanent and disfiguring enlargement such as one sees in elephantiasis.

Vegetable Parasites.—The number of diseases which are believed to depend on vegetable parasites is quite large. The limits of this class of cutaneous disorders are not at present definitely fixed. The micro-organisms, bacilli, cocci, etc., are considered to be representatives of vegetable life, and in quite a number of diseases their presence, though pointing to them as causal agents, does not certainly prove it. The vegetable parasites which have been most clearly shown to be causes of dermatoses are varieties of fungi, and the three diseases with which they are associated are ringworm in its various forms, tinea versicolor, and favus. Though it is

at present impossible to arrange a dermatological classification on an etiological basis, there is reason to think that many diseases which are in their pathological anatomy very different will eventually be classed as dermato-mycoses. Some diseases which were formerly classed simply as inflammations are now known to depend on the presence of bacteria; erysipelas, furuncle, and sycosis are examples. The experiments of Petrona, Letzerich, and others point to the conclusion that some cases of hæmorrhage into the skin are due to the presence of micro-organisms. Among the diseases classed as hypertrophies it is well established that *verruca necrogenica* is the result of infection with tubercle bacilli. It has already been shown that some of the new growths, like *lupus vulgaris*, leprosy, and *rhinoscleroma* are the results of bacterial action, and there are many who urge a like cause for *molluscum epitheliale* and carcinoma. This is not the place to mention each infectious dermatosis, with the particular micro-organism which is its cause; that belongs to special etiology. Here it is sufficient to call attention to the great importance of this element in dermatology. As in other branches of science, when a great law has been enunciated there is a tendency, in the enthusiasm of the moment, to extend it till it obscures other well-known laws; so in dermatology many mistake assumptions for facts, and accept a micro-organism as the cause of a disease on insufficient grounds. In our anxiety to explain and elucidate the etiology of skin diseases we must not forget that, before we know that a given bacterium is the cause of an affection of the skin, our observations must conform to the laws laid down by Koch:

1. The micro-organism must be constantly found in the blood or tissues of those suffering from the disease.

2. This micro-organism must be cultivated outside of the body till it is entirely free from all matter belonging to the body from which it came.

3. Cultures, when inoculated into a susceptible animal, must produce the original disease.

4. In the tissues of this last animal the micro-organism must be found which was in the original subject.

Thus, though on many grounds, from the clinical history, therapeutic results, etc., we may be reasonably sure that a great number of affections of the skin are the results of the presence of micro-organisms, the fact remains that the scientific proof of such an etiology, demanded by the criteria just mentioned, has been attained in only a few diseases. The indefatigable labors of many eminent bacteriologists lead us to hope that in the near future many points in etiology which are now obscure may be made plain.

DIAGNOSIS.

Perhaps in dermatology more than in any other branch of medicine a correct diagnosis is entirely dependent upon the ability of the observer to appreciate minute details, and to so group these oftentimes slight premises that their logic is irresistible. In dermatology the eye and the touch form our principal means of diagnosis, and correct conclusions do not depend so much upon the skillful use of specially devised instruments as upon shrewdness and soundness of judgment.

Light.—In order that we may make a diagnosis with the greatest ease, it is necessary that we surround the case to be examined by the most favorable circumstances. Every disease of the skin should be examined under a proper light. Sunlight is the best, and, as a rule, the time at which an examination will be most satisfactory is the morning. The direct rays of the sun should not fall upon the surface to be examined. The walls of the room should not be of a color which may be reflected upon the skin and thus interfere with the appreciation of its real color; thus walls tinted green or red are bad, while a light gray is perhaps the best tint.

Temperature of the Room.—The temperature of the room should be agreeable, for if it be too cold, capillary congestion of the skin may occur, causing a mottling which is very confusing. The whole cutaneous surface must be examined. The importance of this can not be overestimated; for only in this way can the entire extent of the disease be known, and its lesions, grouping, evolution, etc., be determined.

Having thus arranged the circumstances of the examination, we proceed to observe the patient.

Age, Sex, and Social Condition.—Many affections of the skin are only to be found at certain ages, and thus the time of life of the person under examination at once speaks for or against them. Epithelioma is usually found in advanced life, while lupus develops first in the young. The sex also is of some importance, though it has been often overestimated. Lupus erythematosus, for instance, is most common in women, and epithelioma of the lower lip in men. The surroundings and manner of life of the person are aids in diagnosis. Syphilis is more apt to be found in a prostitute than in a respectable woman; lice attack especially the filthy and careless. The occupation of the patient will often afford a valuable clue to the diagnosis; eczema is frequently found in bakers, grocers, plasterers, barkeepers, and washerwomen, from the irritating nature of the materials which they handle; those who work in sugar refineries not uncommonly suffer from furunculosis; many dermatites are evoked by the handling of chemicals.

Regional Distribution.—We next ascertain how much of the surface is involved, and what regions are especially affected. Some skin affections, as the eruptive fevers, attack the entire surface; while in others only a limited portion is affected, as in lupus, epithelioma, etc. Furthermore, many eruptions manifest a predilection for certain regions, which they are found occupying with considerable constancy. The following table from Pye Smith, somewhat modified, illustrates this relation. In this table the regions are mentioned, with the diseases which are most apt to be encountered occupying them:

Scalp.—Eczema, seborrhœa, alopecia, alopecia areata, psoriasis, syphilis, steatoma, favus, ringworm (in children), pediculosis.

Face.—Forehead: Chloasma, syphilis, psoriasis, acne, zoster, epithelioma. Eyebrows: Seborrhœa, alopecia areata, alopecia syphilitica. Eyelids: Xanthoma, milium, eczema tarsi. Nose: Lupus, syphilis, epithelioma, rhinoscleroma, rosacea, seborrhœa. Nose and cheeks: Rosacea, lupus erythematosus. Nostril orifice: Folliculitis, impetigo, herpes. Upper lip: Eczema, herpes, lupus. Lower lip: Epithelioma, syphilis. Mucous membrane of mouth: Herpes, syphilis, measles, smallpox, leucoplakia, lupus, lichen planus, pemphigus. Bearded face: Sycosis, pustular eczema.

Ears.—Lupus erythematosus, lepra, xanthoma tuberosum, syphilis, eczema.

Neck.—Scarlatina, eczema, intertrigo, furuncle, carbuncle, sycosis.

Back.—Acne, tinea versicolor, pediculosis, seborrhœa, carbuncle.

Chest.—Scarlatina, varicella, syphilis, seborrhœa, keloid, lenticular cancer. Breasts: Eczema, keloid. Nipple: Scabies, eczema, Paget's disease.

Sides of Trunk.—Zoster, syphilis.

Abdomen.—Typhoid and typhus rashes, tinea versicolor, syphilis, scabies. Umbilicus: Scabies, carcinoma, erysipelas.

Scrotum.—Eczema, pruritus, syphilis, elephantiasis.

Prepuce.—Scabies, herpes, syphilis, chancroid, eczema.

Nates.—Furuncle, carbuncle, scabies, syphilis.

Anus.—Eczema, pruritus, mucous tubercles.

Elbows.—Flexor side: Eczema, xanthoma planum. Extensor side: Psoriasis, ichthyosis, xanthoma tuberosum.

Forearms and Backs of Hands.—Erythema multiforme.

Wrists.—Flexor side: Scabies, lichen planus. Extensor side: Smallpox.

Hands and Feet.—Eczema, scabies, callositas. Palms and soles: Eczema, syphilis. Fingers and toes: Chilblains, pompholyx. Nails: Hypertrophy, onychomycosis, onychia, paronychia, atrophy.

Axillæ and Groins.—Eczema, intertrigo, ringworm, erythrasma.

Thighs.—Extensor side : Prurigo, keratosis pilaris.

Knees.—Extensor side : Psoriasis, ichthyosis. Flexor side : Eczema.

Legs.—Eczema, elephantiasis, ulcers, erythema nodosum, purpura, ecthyma.

Primary Lesions.—The individual lesions which make up the eruption should now be studied. The total number of primary lesions is much less than the entire number of skin affections ; so we will find the same lesions present in a number of diseases which are wholly different, both etiologically and pathologically. If, however, we have determined the type of the lesion, we often find that the field of inquiry is thus decidedly narrowed. For example, in a case presenting macules we know at once that we have not to do with pemphigus or urticaria or zoster, for these affections present entirely different lesions. In some affections a uniform type of eruption is preserved, as we see in zoster, lichen planus, and psoriasis ; in others a multiformity of lesion is the rule. This feature, instead of adding confusion, may, in diseases in which it is a well-marked phenomenon—as syphilis, dermatitis herpetiformis, eczema, etc.—become an aid in fixing the nature of the malady.

Distribution.—It is of importance to note whether the disease affects one or both sides, and whether the lesions have any definite arrangement. Herpes zoster, for example, is usually found only on one side of the body, while psoriasis is essentially a bilateral affection. In zoster, syphilis, and ringworm the grouping of the lesions is an important feature.

Color.—One of the most important guides to diagnosis is afforded by the color of the eruption. The peculiar brownish red of syphilis is very different from the bright red of psoriasis ; the brown color of tinea versicolor, the yellow of favus, the translucent brown of lupus nodules, the varying shades of herpes iris, are all more or less characteristic. Not only does the color aid in distinguishing the various diseases, but from it we may often draw an inference as to the acute or chronic nature of the malady. In long-standing inflammations brown or yellow pigmentary deposits are often present, while about an effusion of blood, which has existed for some time, the play of colors so characteristic of a bruise may be noted.

Odor.—The odor emanating from an affection of the skin will sometimes give a clew to diagnosis. Favus smells like a mouse's nest ; syphilitic ulcerations sometimes have a peculiarly disgusting odor ; while the characteristic smell of gangrene is well known.

Secondary Lesions.—The various secondary lesions have often a direct bearing upon diagnosis. The scaling of psoriasis is one of its most marked features ; an oozing eczema is sure to be heavily crusted ; gummata readily break down, leaving punched-out ulcers ; late syphilis leaves

thin flexible scars in the center, while the periphery still spreads; in lupus, on the contrary, the scars are thick, adherent, and traversed by bands and cords. Scratch-marks are a sure indication of the itching nature of the disease, and are of great importance in diagnosis.

Touch.—The affected skin must also be examined by the sense of touch, for in this way we make out the depth to which the lesions extend, the temperature, the amount of infiltration, fluctuation, etc.

Chemistry.—Chemistry as directly applied has not been of much service to dermatological diagnosis; but a careful examination of the urine should never be omitted, as in this way we may often discover a Bright's disease or a diabetes lying back of a furunculosis or an eczema of the genitals.

Microscope.—The microscope is of the highest importance. By it the nature of tumors and growths may be determined, light may be shed upon the real pathological process in obscure cases, and the presence of parasites demonstrated.

Subjective Symptoms.—The objective signs that are discovered by the physician are, in dermatology, as in all departments of medicine, of far more value than the information elicited from the patient; but such aid as can be afforded by a careful consideration of the subjective symptoms and the history of the case is not to be overlooked. The sensations produced are to a certain extent characteristic of some skin diseases. Eczema is *par excellence* the itching disease; neuralgic shooting pains are often noted with herpes zoster; joint pains occur with purpura rheumatica. The very absence of subjective symptoms caused by the eruption may be of significance. In syphilis, for example, the patient usually complains of no sensations referable to the lesions. Occasionally considerable light may be given by the patient's account of his malady—its origin, the primary lesion, the evolution, etc. Of course, all this information is to be accepted only after having been duly weighed and measured by the knowledge and experience of the physician.

CLASSIFICATION.

By PRINCE A. MORROW, M.D.

THE object of dermatological classification is to group together diseases which have important characteristics in common, in order to facilitate their study. Within the past hundred years numerous systems have been constructed which vary in principle and detail according to their authors' conception of what constitutes the proper method of arrangement. Diseases of the skin have been classified according to their external form, their clinical unity, the character of the pathological process, the etiological factors involved, and their pathogenesis.

The system of Willan, which was simply a modification of that previously proposed by Plenck, was based upon the view that the character of each disease was imprinted upon the cutaneous surface in lesions of a definite anatomical form which were more or less pathognomonic. All diseases of the skin were arbitrarily divided into classes according to their more typical elementary lesions, entirely irrespective of the nature of the morbid process producing them. It had the conspicuous defect of ranging in the same group diseases of the most diverse character, which were united by but one point of contact—their external appearance; and since many dermatoses are characterized by a variety of lesions, it necessitated placing the same disease in different groups, according to the predominance of the eruptive element. While Willan's system possesses many advantages of simplicity and convenience for purposes of diagnosis, it is evident that identity of anatomical form alone is defective as a basis of classification, since it furnishes no clue to the real nature of the disease, and is therefore valueless as an aid to therapeutics.

Alibert's attempt to classify diseases of the skin according to their clinical features and natural affinities, though correct in principle, was characterized by so many imperfections in detail that it soon fell into oblivion.

Hebra's classification, which represented a distinct step in advance, was based upon the principle that the most essential feature of skin disease was exhibited in the character of the pathological process. With the exception of certain functional anomalies, most diseases of the skin were classified upon the basis of their pathological anatomy. Recognition was

given to the etiological element in only one of his groups—the *Parasitæ*. The objection to what may be termed the anatomico-pathological classification is much the same as that applied to the purely anatomical system. While much more comprehensive and complete, it unites in the same group affections which are entirely different in nature and pathogenetic mode, and which are wholly unrelated to each other on etiological lines. In addition, due importance is not always assigned to the primordial factors which play the principal rôle in initiating the morbid process. Diseases are classed as atrophies, hypertrophies, and new growths, whose essential changes, which precede and determine the cutaneous phenomena, may be neuritic in character. Notwithstanding the inherent defects of Hebra's system, it still remains the most practical yet devised, and with certain modifications in detail has been generally accepted by American dermatologists as the best basis of clinical study.

From the time of Lorry the genius of the French school has always been in the direction of classifying skin diseases according to their etiological relations. Bazin divided all cutaneous affections into three classes: the first comprising those which result from external causes; the second one embracing affections of internal origin, including those consecutive to some constitutional disorder; and the third containing cutaneous deformities, either congenital or acquired.

Bazin's classification is open to serious criticism, as it assumes a direct relation of cause and effect between certain general diseases and cutaneous affections, which has by no means been established. It does not specify with sufficient precision the exciting etiological factors, besides entirely ignoring the local independent character of many cutaneous processes. His contemporary, Hardy, objects to it on the ground that its basis is too narrow and insufficient and that it creates artificial divisions. He insists that the relations of skin diseases should be expressed in the terms of general pathology, for the reason that affections of this organ are subject to the same pathological laws as govern morbid processes in other organs of the body. His own classification, he claims, has the merit of uniting in the same classes eruptions which have analogous origins, which present common symptoms, and which demand the same order of therapeutic measures.

Unfortunately, the causes of skin disease are too imperfectly understood to admit of an etiological classification. Notwithstanding the important advances recently made in this direction, especially in our enlarged appreciation of the pathogenetic agency of micro-organisms, the causes of many skin diseases still escape recognition. Predisposing and exciting causes are so interdependent and interactive that it often becomes impossible to resolve this etiological complex into its component parts and assign to each class of factors the precise measure of their pathogenetic

influence. The primary, most essential causes of skin disease inhere in the skin itself, and constitute a special local predisposition to disturbances of function or nutrition, without which many external or internal exciting causes would be entirely inoperative. No system of classification can take cognizance of the functional and structural peculiarities of the individual skin which dominate its morbid reactions.

A review of the more important classifications which have from time to time been proposed would be incomplete without reference to Bronson's elaboration of Auspitz's system. This scheme involves in its plan a consideration of the genealogy of skin diseases, and the classes which are arranged according to the anatomical seat of the disease are subdivided into orders, tribes, families, genera, and species, with especial reference to the structure or function involved, the pathological and clinical types, the pathogenesis, and the local affection. While the principle of arranging diseases into natural groups is eminently philosophical, the elaborated scheme is too complex and complicated in detail to serve as a working basis for the student of skin diseases.

In the present state of our knowledge it is evident that no classification can be constructed which shall conform to the requirements of a scientific system and be consistent in all its details. Any system of classifying skin diseases must be looked upon as provisional merely, and subject to such modifications as the evolutionary requirements of our knowledge may impose.

In the classification herewith presented, which follows, with certain changes, Crocker's modification of Hebra's system, the plan of grouping together diseases which are pathologically most closely related has been generally adopted. In doing away with the class of "Hyperæmias," and grouping all erythemas under the general head of "Inflammations," it is understood that the latter term is employed in its more extended rather than its absolute sense. Urticaria has been classed with "Neuroses," because in its nature and pathogenesis it is essentially a cutaneous neurosis. Certain inflammatory affections of the glandular apparatus have been placed under the general class of "Diseases of the Appendages of the Skin," in order to meet the requirements of greater clinical convenience.

CLASS I.—INFLAMMATIONS.

	<i>Most Prominent Primary Lesions.</i>
Exanthemata	Multiform lesions.
Erythema simplex	Erythema.
“ pudoris et iracundiæ	“
“ neonatorum	“
“ traumaticum	“
“ caloricum	“ and pigmentation.
“ intertrigo	“
“ læve	“
Symptomatic erythema	“
Erythema scarlatiniforme	“ punctate and diffuse.
“ exudativum multiforme	“ with multiform lesions.
“ bullosum	“ with bullæ.
“ iris	“ with vesicles.
“ nodosum	“ and nodular swellings.
“ induratum	“ and brawny infiltration.
Peliosis rheumatica	“ and hæmorrhages.
Erysipelas	“ and œdematous swelling.
Erysipeloid	“ “ “
Pellagra	“
Acrodynia	“
Furunculus	Phlegmonous.
Anthrax benigna (carbunculus)	“
“ maligna (malignant pustule)	“
Equinia	Multiform lesions.
Dissection wounds	Pustular and papillomatous lesions.
Impetigo	Vesico pustules.
“ contagiosa	“ “
Ecthyma	Pustules.
Dermatitis herpetiformis	Multiform lesions.
Pompholyx	Vesicles.
Herpes	Grouped vesicles.
“ facialis	“ “
“ progenitalis	“ “
“ zoster	“ “
Hydroa	Bullæ.
Pemphigus vulgaris	“
“ foliaceus	“
“ vegetans	“
Impetigo herpetiformis (Hebra)	Grouped miliary pustules.
Prurigo	Papules.
Eczema	Multiform lesions.
Dermatitis repens	Epidermic denudation and fluid exudation.
“ seborrhoica	Multiform lesions.
Psoriasis	Scales on red base.
Pityriasis maculata et circinata	Patches with fine scales.
Dermatitis exfoliativa	Patches with large scales.
Pityriasis rubra	“ “ “
Epidemic exfoliative dermatitis	“ “ “
Dermatitis exfoliativa neonatorum	“ “ “
Parakeratosis variegata	Papules.

	<i>Most Prominent Primary Lesions.</i>
Lichen ruber (pityriasis pilaris)	Papules and scales.
“ planus	Flat papules.
“ scrofulosus	Convex papules.
Dermatitis medicamentosa	Multiform lesions.
“ venenata	“ “
“ calorica	“ “
“ traumatica	“ “
Feigned skin diseases	“ “
Sphaceloderma	Gangrene.
Dermatitis gangrænosa infantum	“
Multiple gangrene in adults	“
Symmetrical gangrene	“
Diabetic gangrene	“

CLASS II.—HÆMORRHAGES.

Purpura simplex	Blood extravasation.
“ hæmorrhagica	“ “

CLASS III.—HYPERTROPHIES.

	<i>Part principally affected.</i>
Lentigo	Pigment.
Chloasma	“
Anomalous discoloration of the skin	“
Acanthosis nigricans	“ with papillary growths.
Keratosis pilaris	Hair follicles.
“ senilis	Epidermis.
“ palmaris et plantaris	“
Kerato angioma	“ with vascular tumors.
Callositas	“
Clavus	“
Cornu cutaneum	“ and papillæ.
Verruca	“
Papilloma cutis	Papillæ.
Nævus pigmentosus	Pigment neoplasm.
Xerosis	Epidermis and papillæ.
Ichthyosis simplex	“ “
“ hystrix	“ “
Scleræma neonatorum	Corium.
Edema neonatorum	“
Scleroderma	“
“ diffuse symmetrical	“
“ circumscribed (morphœa)	“
Elephantiasis	The entire skin.
Acromegaly	Skin and subcutaneous tissues.
Myxœdema	“ “ “

CLASS IV.—ATROPHIES.

Leucoderma	Pigment.
Albinismus	“
Vitiligo	“

Atrophia of the skin	Corium.
“ idiopathic	“
“ senilis	“
“ maculosa et striata	“
Perforating ulcer of foot	Trophic nerves.
Glossy skin	“
Ainhum	“

CLASS V.—NEW GROWTHS.

	<i>General Character.</i>
Cicatrix	Benign.
Keloid	“
Fibroma	“
Xanthoma	“
“ diabeticorum	“
Lipoma	“
Myoma	“
Neuroma	“
Angioma	“
“ nævus vascularis	“
Telangiectasis	“
Angioma serpiginosum	“
Xeroderma pigmentosum	“
Lymphangioma	“
“ acutum	“
“ circumscriptum	“
“ cystic	“
Rhinoscleroma	Infiltrating.
Tuberculosis cutis	“
Lupus vulgaris	“
Tuberculosis verrucosa	“
Serofuloderma	“
Lupus erythematosus	“
Leprosy	“
Morvan's disease	Degenerative.
Colloid degeneration of the skin	“
Adenoma sebaceum	Benign.
Adenoma of sweat-glands	“
Multiple benign cystic epithelioma	“
Lymphangioma tuberosum multiplex	“
Multiple benign tumorlike new growths of the skin	“
Leucokeratosis buccalis	“
Psorospermiosis cutis	Degenerative.
Keratosis follicularis	“
Molluscum contagiosum	“
Paget's disease	Malignant.
Epithelioma	“
Rodent ulcer	“
Carcinoma cutis	“
Sarcoma	“
Mycosis fungoides	“
Framboesia, or yaws	“

	<i>General Character.</i>
Verruga	Malignant.
Endemic boils of tropical and subtropical countries	"
Tropical phagedenic ulcer	"

CLASS VI.—NEUROSES.

Sensory Neuroses	Sensory disorders.
Hyperæsthesia	" "
Anæsthesiæ	" "
Paræsthesiæ	" "
Dermatalgia	" "
Pruritus	" "
Senso-motor Neuroses	Senso-motor disorders.
Urticaria	" "
" pigmentosa	" "
Angioneurotic œdema	" "

CLASS VII.—DISEASES OF THE APPENDAGES OF THE SKIN.

A. SWEAT-GLANDS:

1. Functional disorders.

Hyperidrosis	Excessive secretion
Anidrosis	Secretion absent.
Bromidrosis	Altered in quality.
Chromidrosis	" "
Uridrosis	" "
Hematidrosis	" "
Phosphorescent sweat	" "

2. Organic affections.

Hidradenitis suppurativa	Inflammation.
Miliaria rubra	"
" crystallina	Retained secretion.
Chronic miliaria	" "
Hidrocystoma	" "

B. SEBACEOUS GLANDS:

Seborrhœa	Excessive secretion.
" oleosa	" "
" sicca	" "
Asteatosis	Secretion absent.
Comedo	Retained secretion.
Milium	" "
Steatoma	" "
Acne	Inflammation.
" simplex	"
" vulgaris	"
" rosacea	"
" varioliformis	"

C. HAIR-FOLLICLES:

Canities	Loss of pigment.
Discoloration of the hair	Anomalies of pigment.
Hypertrichosis	Excessive growth.
Atrophia pilorum propria	Defective growth.

	<i>General Character.</i>
Fragilitas crinium	Defective growth.
Trichorrhæxis nodosa	" "
Trichiasis	Anomalous growth.
Distichiasis	" "
Plica polonica	_____
Piedra	_____
Alopecia	Baldness.
" areata	" in patches.
Folliculitis decalvans	Inflammation.
Dermatitis papillaris capillitii	" and keloid.
Conglomerate suppurative perifolliculitis	"
Sycosis	"
D. NAILS:	
Onychauxis	Overgrowth.
Atrophia unguis	Atrophy.
Onychia	Inflammation.
Onychomycosis	Fungous growth in nail.
Leucopathia unguium	Pigment deficiency.
Spoon nails	Dystrophia.
Reedy nails	"
Pterygium	Overlapping of nail fold.

CLASS VIII.—PARASITIC DISEASES.

A. VEGETABLE:	<i>Parts affected.</i>
Tinea favosa	Hair and skin.
Tinea trichophytina	" "
<i>a.</i> Tinea circinata	Skin.
<i>b.</i> " tonsurans	Hair.
<i>c.</i> " barbæ	"
Tinea imbricata	Skin.
Fungous foot of India	Skin and deeper tissues.
Actinomyces of the skin	" " "
Tinea versicolor	Skin.
Erythrasma	"
Pinto disease	"
B. ANIMAL:	
Scabies	Skin.
Demodex folliculorum	Follicles.
Pediculus capitis	Scalp.
" corporis	Skin.
" pubis	Hairy surfaces.
Filaria medinensis	Subcutaneous tissues.
Pulex irritans	Skin.
" penetrans	"
Cimex lectularius	"
Culex pipiens	"
Ixodes ricinus	"
Leptus autumnalis	"
Dermanyssus avium	"
Cysticercus cellulosæ cutis	Subcutaneous tissues.
Echinococcus hydatid	Skin.

PART II.—SPECIAL.

CLASS I.—INFLAMMATIONS.

THE EXANTHEMATA. (J. E. GRAHAM.)

CERTAIN contagious eruptive fevers which have many features in common are classed under the term *exanthemata*. These are scarlatina or scarlet fever, morbilli or measles, rubeola or German measles, variola or smallpox, varicella or chicken pox, and vaccinia. These diseases present certain common characteristics: they are infectious, specific, as a rule epidemic, and are characterized by eruptions on the skin, which vary in regard to seat and intensity, and are accompanied by general constitutional conditions. They are self-limited in duration, and most of them are peculiar to childhood.

The eruptive fevers afford immunity, as a rule, to the individual who has been once attacked. They are all, however, liable to recur, but recurrence is not common.

Although these are recognized as specific fevers, a specific germ has not been isolated in any case. Micro-organisms have been discovered which were supposed to be the causes of scarlatina and variola, but as yet proof is wanting of their genuineness. A peculiarity of exanthemata is the presence in many cases of various pus organisms.

Two eruptive fevers may coexist in the same patient at the same time. The following combinations have been reported: Measles and scarlatina, measles and variola, scarlatina and varicella, variola and vaccinia. Vaccinia may occur with any of the other fevers.

When two eruptions occur simultaneously they may influence one another, but they never combine to form another disease. When measles and scarlatina exist together, the exposure to the latter may have taken place after that of measles. In such a case the eruption of scarlatina is the most prominent, and the prognosis is usually grave. When the patient is exposed to the infection of measles and scarlatina at the same time the eruption of the latter often disappears before that of the former commences. When measles and variola occur together the maturation of the pustules may be retarded, but the general course of the eruption is not interfered with.

SCARLATINA (Scarlet Fever—Scarlet Rash). (J. E. GRAHAM.)

Definition.—Scarlatina is a contagious eruptive fever, which runs an acute course, is self-limited in duration, and occurs most frequently in children. Although usually accompanied by severe constitutional symptoms, it may exist in a very mild form. It is always marked by more or less intense inflammation of the throat.

Symptomatology.—*Regular Form.*—Similar to the other exanthems, the course of scarlet fever has been divided into stages: invasion, eruption, and desquamation. After a period of incubation, which usually lasts five or six days, the disease is ushered in by the sudden occurrence of severe constitutional symptoms. In occasional cases, however, the onset is more gradual. A child in good health becomes suddenly ill and is compelled to lie down. Nausea, and often vomiting, supervene. Chills, more or less violent, then occur, followed by fever. The face becomes red, the lips dry, and a sense of dryness and fever is experienced in the throat; intense thirst becomes a prominent symptom—more prominent when the chills and vomiting are absent. In a few hours these symptoms reach their maximum. The pulse is then full and very rapid, from 120 to 140 and even as high as 180 a minute. The skin is dry and burning, and on account of the great dryness the temperature seems to the touch even higher than it actually is. The temperature in the axilla may rise as high as 104° and 105°. In some cases the patient is agitated, throwing himself about in the bed, asking for water, while in others he seems dull, apathetic, and prostrated. He takes short sleeps, and wakes up frequently, complaining of pain in the throat upon swallowing. One may note at this stage some swelling below the maxilla. The tongue presents a grayish fur, thick in the center, thinner and penetrated by swollen papillæ near the edges. More or less diarrhœa may be present.

The duration of the stage of invasion is usually from twelve to thirty hours, occasionally as long as three days. Trousseau has reported an extraordinary case, in which the rash did not appear for eight days after the onset of severe constitutional symptoms. Thirial and Jacoud have reported similar cases.

Eruption.—The rash may appear on many parts of the body about the same time, but it is usually found first on the sides of the neck, then on the chest and abdomen, extending afterward to the extremities and to the face. The skin in the immediate neighborhood of the mouth and nose escapes. The eruption attains its maximum in two or three days, remains stationary for from twenty-four to thirty-six hours, and then gradually disappears, the duration depending upon its intensity. It may not remain

longer than a few hours, thus escaping even the notice of parents; but it usually lasts four or five days, and even as long as ten or twelve. The rash, when well marked, is of a bright scarlet-red color, and consists of small dots or puncta, in which the color is most intense, and from these there is a gradual fading away until the redness becomes lost in the surrounding skin. Often the patches are confluent, so that the whole surface is covered. These puncta are not elevated, and the color disappears on pressure. When the finger nail is drawn over the surface a white streak is left, which rapidly changes to the surrounding red. When the puncta are close to one another the color is more intense. In some cases it is a deep purple or dusky, and petechiæ may be present. Watson has pointed out that the spots on the forearms and legs, as well as on the backs of the hands and feet, are larger and may be more elevated than elsewhere. On account of the hyperæmia there is a swelling of the skin, which, however, is scarcely noticed on account of the general character of the eruption. When the spots are quite discrete it is not impossible to feel them. Miliaria, present in some cases, more often in adults, may be the result of profuse perspiration, although this is not generally the case.

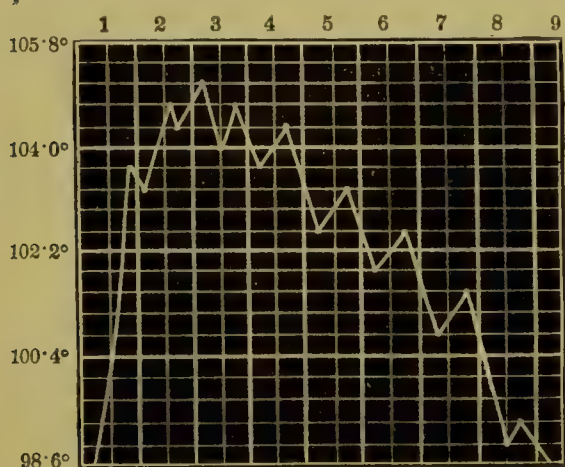
During this stage the tongue undergoes desquamation more or less complete, presenting a deep red color, and roughened by swollen papillæ (strawberry tongue). The desquamation usually occurs between the third and fifth days of the eruption. The mucous membrane of the soft palate, uvula, and pillars of the fauces is reddened and swollen, and this redness may extend forward over the inner surface of the mouth. The tonsils are also swollen, and the follicles distended by a yellowish-white exudate, which in some cases passes over the surface, forming a pseudo-membrane. In moderately severe cases there may be ulceration, and even slight gangrene, while in others again an abscess may be found in the tonsil itself. The glands under the maxilla and in the neck become swollen, and the cellular tissue in their neighborhood may be infiltrated—a condition which increases the pain and difficulty upon swallowing. In favorable cases this inflammation subsides, but the glands remain for a time enlarged.

The development of the rash does not produce any remission in the constitutional symptoms; but, on the other hand, the temperature may rise and the pulse become more rapid. The headache may be intense, while delirium and convulsions occasionally occur. There is a continued loss of appetite as well as nausea, and sometimes vomiting. The abdomen is slightly distended, and sometimes there is tenderness over the hepatic region. The respirations are hurried, and there may be some signs of coryza and bronchitis. The urine is of high specific gravity, scanty in the earlier stages, and sometimes contains albumen.

These constitutional symptoms generally reach the climax when the

eruption is fully developed, and gradually subside until about the fifth day, when they disappear. In some cases the temperature falls by crisis three or four degrees, and in others there may be a slight fall, followed by a rise.

Desquamation.—As a general rule, a few days elapse between the disappearance of the eruption and the commencement of the stage of desquamation; but the process may begin before the eruption has disappeared. It commences on those situations where the rash first develops, and may be distinctly noticed in cases where the eruption has been so slight as to have been overlooked. The epidermis is exfoliated in large scales from the trunk, and in still larger flakes from the extremities, especially the fingers and toes. The finger and toe nails are rarely if ever lost, but, as has been pointed out by Wilkes, an evidence of interference with the nutrition in the form of a transverse groove is often found on the nail after the disease has passed off. The stage of desquamation lasts usually four or five weeks, not often less than two nor



Eruption.
FIG. 15.—Scarlet fever (Strümpell).

longer than seven or eight weeks. During this period the fever disappears completely, the tonsils become reduced in size, and the tongue is again covered by epithelium, and often presents on the surface a whitish fur.

The temperature curve in scarlatina is as a rule very marked, and is a great aid in diagnosis.

During the first day it rises to 103°–104°, and in some cases

may reach 106° or 107°. It remains high, not being affected by the presence of the eruption, except that it may rise even to a higher point. During the stage of eruption it is more or less of a continued character, with a daily remission of one half to one degree. In light cases it falls on the fourth or fifth day, and in moderately severe cases on the twelfth day. But in many it is continued longer, the result of angina, glandular inflammation, or septic absorption. Children lose weight rapidly during an attack.

Irregular Forms.—The stage of eruption is in some cases abnormally short—a few hours—while in others it may extend over nine or ten days. In the latter case the eruption is often dusky. Occasionally a recession takes place after the first day, followed by what would appear to be a second eruption. In some, angina is present without eruption, and in

this form desquamation may follow, and complications may arise which are generally found in severe cases.

Malignant Scarlatina.—*The Ataxic Form.*—A child in good health becomes suddenly ill, complains of severe headache and vomiting, the countenance is cyanosed, pulse rapid, and the patient soon lapses into an unconscious state. More or less violent delirium supervenes, followed by coma and death. The fatal issue may take place before the appearance of the eruption. The temperature may rise in such cases to 105° or 106° , and instances were reported by the late Dr. Woodman in which the temperature rose much higher. The patient seems to be overwhelmed by the intensity of the poison, and the vital powers soon succumb.

Hæmorrhagic Form.—Extravasation of blood may take place under the skin and mucous membrane, and blood may also be discharged from the bladder and bowels. This hæmorrhagic condition generally develops when the eruption appears, but it may be secondarily produced—that is, after septic infection. In these cases there is usually great prostration, and a generally adynamic condition. There may, however, be active delirium, followed by convulsions and coma. A fatal result often follows in two or three days.

The Anginose Form.—Here the throat symptoms are very intense, resulting in great swelling of the fauces and tonsils, together with the formation of a pseudo-membrane, which is easily detached from the surface, and which may extend into the larynx. Ulceration and gangrene of the mucous surface may follow, accompanied by great fetor of the breath. The glands of the neck at the same time become very much enlarged, and an intense inflammation of the surrounding connective tissue follows, which may terminate in ulceration or gangrene.

Puerperal and Traumatic Scarlatina.—Cases have been from time to time reported in which a scarlatinal rash has followed confinement or a severe surgical operation. It is difficult to say how many of these have been true scarlatina. Dr. Louis Guignon, in Charcot's *Traité de Médecine*, gives the following classification:

1. True scarlatina.
2. True scarlatina modified by the soil upon which it is developed.
3. Septicæmic eruptions.
4. The eruption produced by drugs, such as belladonna, chloral, corrosive sublimate, etc.

In many cases it is difficult to decide which of these conditions may be present. However, by following the ordinary rules for diagnosis, and by carefully observing the various conditions present, a correct conclusion may be arrived at.

Complications.—These may arise from exaggeration of the normal process, from the intercurrent of another disease, and from secondary affections due to septic poisoning. In cases of severe inflammation of

the throat and pharynx, the diseased condition may pass up into the middle ear or downward into the larynx.

The pseudo-membranes of the angina are of two different characters, the pseudo-diphtheritic and the true diphtheritic.

The *pseudo-diphtheritic* appears early, between the third and sixth days, and sometimes even before the eruption. It rarely attacks the larynx, and is more opaque, whiter, less adherent, and more friable than that of diphtheria. It may spread over the tonsils, lips, and around the mouth, and may be accompanied by necrosis. In the malignant or septic form the membranes take on an extensive growth, accompanied by more or less ecchymosis and ulceration of the mucous surface. A thick, viscid mucus fills the mouth and pharynx, which may contain more or less blood, and often emits a foul odor. Parts of the tonsils and mucous surface may become gangrenous. In such severe cases the fever is intense and the adynamia complete.

The *true diphtheritic membrane* appears later, usually in the second or third week. It is of a yellowish-white color, is removed from the mucous surface with difficulty, and is marked by the presence of the Klebs-Loeffler bacillus.

Streptococci, which exist in the scarlatinal membrane, may penetrate the mucous surface, pass along the lymphatics into the adjacent glands, produce there suppuration, and invade the surrounding tissues. In severe cases the swelling of the neck, which is very pronounced, is at first hard, then softens, and the skin upon the surface inflames and sloughs. Pus discharges in large quantities, often from separate openings. Ulceration sometimes takes place into the jugular vein, or the pus may find its way into the larynx or trachea, producing asphyxia. Death is often the result of general infection.

Suppuration of the serous membranes and multiple abscesses are sometimes sequelæ of scarlet fever.

Pericarditis does not often reach the stage of suppuration, and endocarditis is usually of the vegetative or ulcerative variety.

In the so-called scarlatinal rheumatism the exudation into the joints may be serous or purulent in character. The streptococci are found in both forms. It is therefore probable that these joint affections are not really rheumatic in character, but are due to septic infection.

Otitis media results from an extension of the inflammatory process from the pharynx through the Eustachian tube, and occurs more frequently during the stage of eruption. It is accompanied by severe pain, and a slight elevation of temperature. Inflammation of the external meatus is occasionally met with. Meningitis and thrombosis of the lateral sinuses follow this condition. The labyrinth may also be affected, and swelling of the mucous membrane, ulceration, and caries may occur.

There are two forms of albuminaria: first, that occurring during the stage of eruption, and the second and more grave form in the stage of desquamation.

The proportion of cases of *early* albuminuria varies in different statistics. It is probably not so frequent as in typhoid fever. It is necessary to examine the urine daily to detect it, as the condition only lasts a short time. The amount of albumen is not great, and is probably due to high temperature. Hæmaturia and anuria are very fatal complications.

The proportion of cases of *late* albuminuria also varies very much in different epidemics. It generally appears at the end of the first, or during the second week after the eruption has passed away, and is accompanied by more or less febrile movement. Attention is called to the patient on account of anæmia, puffing under the eyes, or of the dark, scanty urine. The latter is at first scanty and high colored, with high specific gravity, and the sediment contains leucocytes, red blood-corpuscles, sometimes renal epithelium, hyaline and fatty casts. Peptonuria has also been observed. The anasarca may precede the albuminuria by many days, or may follow it.

The constitutional symptoms depend upon the condition of the urine, and are generally uræmic in character, namely, headache, torpor, and vomiting in the lighter forms, and in the grave cases convulsions, delirium, and coma. Visceral troubles, such as pulmonary œdema, pleurisy, bronchitis, and broncho-pneumonia, sometimes accompany albuminuria. This condition may prove rapidly fatal from uræmic poisoning, may pass off in from two to four weeks, or it may persist for months in a slight degree, with a fairly good state of health. It may also become chronic, constituting Bright's disease.

Many theories have been advanced to explain the origin of these changes in the kidney. They are supposed by some to be due to exposure, chilling of the surface, etc. The parasitic origin, however, seems to be the more probable one, as streptococci have been found, and cultivated from the diseased kidney. The condition of this organ depends upon whether death occurs at an early or late stage of the disease. In the early stage the glomeruli are congested, increased in size, and present more or less desquamation of the epithelium. The interstitial tissue may also be affected. When the albuminuria has lasted for a month or longer, we get the same condition of kidney as in Bright's disease.

Ulceration of the cornea is an occasional complication of scarlatina. Cancrum oris is very rarely seen in this disease.

Morbid Anatomy.—During the stage of eruption the cells in the rete are swollen and somewhat vacuolated. The blood-vessels are distended, and perhaps also the lymphatics. The visceral lesions vary in

different cases. In the suddenly fatal forms congestion of the internal organs is frequently seen. In hæmorrhagic scarlatina ecchymoses may be found beneath the serous and mucous membrane, and the spleen in such cases is much enlarged.

The lymphatic glands, especially those of the neck, are swollen. Inflammation of the serous membranes is occasionally met with. In fatal cases the liver is often found enlarged, soft and friable, with vessels distended, and embryonal cells found between the lobules. The tonsils are swollen, and the mucous membranes of the pharynx is congested and sometimes ulcerated.

Etiology.—All cases arise from a specific virus, either directly or indirectly. Contagion may be conveyed directly to a person predisposed, if he remains any length of time in the room of a scarlet-fever patient, and the chances of contagion are greater the longer the time and the closer the contact. It is not probable that the disease can be directly communicated any distance through the air. It is much more frequently carried by some object, such as epidermis cells, letters, books, clothing, etc. Contagion may be carried hundreds of miles in this way.

Some epidemics, as, for instance, that of Hendon, have been traced to milk. It has not yet been proved that the disease ever originated from animals, although the results of observations made in England seemed at first to point that way.

Males and females are equally affected. Ninety per cent of the patients are under ten years of age. There is a great difference in the susceptibility of individuals, and a child may be at one time immune and at another susceptible to the poison. This difference of susceptibility is quite independent of the general health. The disease rarely occurs under one year, and the greatest number between the sixth and tenth years. Immunity is generally acquired after the first attack, but a second invasion after varying intervals has been reported in some cases. In the instances given of the disease occurring several times, dermatitis exfoliativa has in all probability been mistaken for scarlatina.

Scarlet fever may be contagious in any stage, but only to a slight extent during the stage of invasion, and contagiousness reaches its maximum during the eruption and desquamation. The poison enters the system through the respiratory organs, mucous membranes, the pharynx, and tonsils. Cases of inoculation have been reported, but this method of communicating the poison has not been absolutely proved. In all probability the virus of scarlatina is of the nature of a micro-organism, but so far the germ peculiar to this disease has not been discovered. It would therefore be useless to give here an account of the many investigations which have been made, any more than to say that while they have been fruitless, so far as the discovery of a definite micro-organism is concerned,

they have been of great value in determining the importance of the part played by the germs of suppuration.

Diagnosis.—The principal diagnostic points in scarlet fever are the suddenness and violence of the symptoms in the stage of invasion, the sudden rise of temperature, and the great rapidity of the pulse. During this stage it may be mistaken for pneumonia, in which, however, the breathing is more rapid, and pain in the side is generally experienced; whereas in scarlet fever there is an absence of the latter, and the presence of more or less redness of the mucous membranes of the fauces and pharynx. Measles is distinguished from scarlatina by the milder character of the prodromal symptoms and their longer duration, by the presence of nasal catarrh, with more or less cough, and by the difference in the temperature chart. In the stage of eruption the rash is to be distinguished from that due to septic infection and to drugs, such as belladonna, iodine, mercury, antipyrine, and opium, and also from that of dermatitis exfoliativa, measles, and rubeola.

The diagnosis between scarlet fever and the medicinal rashes is easily made on account of the absence of rise of temperature in the great majority of the latter class of cases. The distinction between the eruption of scarlet fever and measles is generally sufficiently marked to prevent mistake. In the latter disease it is distinctly papular in character, appearing on the forehead and face, and unaccompanied by coryza.

In rubeola the difference in the appearance of the rash is not so great, but the constitutional symptoms are so much milder in character that mistakes are not generally made.

In dermatitis exfoliativa the temperature does not rise so high, the throat is slightly if at all affected, and the tongue does not present the appearance peculiar to scarlatina. The desquamation also often begins before the eruption is fully developed, and the finger and toe nails are frequently exfoliated. In cases where this disease recurs two or three times the diagnosis is made without difficulty.

Cases are occasionally met with of pseudo-membranous angina accompanied by an erythematous rash, which present great difficulties of diagnosis. In scarlatina there are the peculiar temperature chart, the very rapid pulse, and the punctate character, as well as the duration of the rash. In diphtheria the temperature does not rise so high, nor is the pulse so rapid, and the erythema which appears in some cases is of a temporary character.

The differential diagnosis between the false and true diphtheritic membranes in scarlatina is often a matter of importance. The points may be briefly given as follows:

Pseudo-diphtheritic.

Appears early in the stage of eruption.

White, friable, and less adherent.

The epithelial surfaces slightly eroded when the membrane is removed.

True diphtheritic.

Usually developed in the second or third week.

Grayish-white, tough; removed with difficulty.

The mucous membrane ulcerated, and presents a bleeding surface when false membrane is removed.

Prognosis.—The prognosis varies in different epidemics. The Anglo-Saxon race is said to be most susceptible to the grave form. The disease is more severe when it occurs in adult life, after traumatism, or during diphtheria, tuberculosis, or the puerperal period in women. A temperature of over 105° , the presence of extensive membranous angina, early glandular swelling of the neck, and cutaneous or visceral hæmorrhages, are all indicative of a grave form of the disease. Nephritis is also a serious complication.

Treatment.—In the mild cases hygienic treatment alone is all that is necessary. The patient should be placed in bed in a comfortable, well-ventilated room, from which all unnecessary furniture, as well as carpets and curtains, have been removed. The temperature of the room should be kept as constant as possible, and the patient should not be too warmly covered, particularly in the early stage. When, however, the fever subsides, the amount of covering may be increased.

Milk and nourishing broths should be the principal articles of diet. More nourishment may be given during the stage of desquamation. Stimulants should be avoided in the early stages. A tepid sponge bath may be given daily, to be followed by an inunction of vaseline with one per cent of carbolic acid. Even in mild cases it is better to spray the mouth and throat with a disinfectant solution, such as boracic acid or listerine.

When the temperature is high, antipyrine or antifebrine may be given, but the best means of reducing fever is by the application of cold. This may be carried out by sponging, cold affusion, cold baths, or by the ice-water coil. If the temperature does not exceed 102° or 103° , the tepid sponge bath may be all that is necessary; but if it exceeds 104° , and the patient is evidently suffering from continued high temperature, more active measures may be adopted. The ice-water coil to the head, or the cold pack, may then be used. In the cold pack, sheets wrung out in water at 65° may be applied for ten minutes. The most effectual way, however, of reducing the temperature is by means of the cold bath. The patient is placed in a bath of the temperature of 90° , which is then gradually reduced to 80° , and allowed to remain there for ten or twelve minutes. During this time care should be taken that the surface of the

body is gently rubbed by the attendant. In severe cases from four to six baths may be given in the twenty-four hours. For nervousness, chloral and bromide have been given with good results. For the depression, carbonate of ammonia, muriate of ammonia, alcohol, and coffee are the most appropriate remedies. When the inflammation of the throat is severe, a spray of a solution of peroxide of hydrogen is perhaps the most effectual.

Careful treatment of the middle ear trouble is most important. Early puncture of the membrana tympani and inflation through the Eustachian tube often prevent deafness.

The later form of albuminuria demands energetic and careful treatment. If the patient is suffering from marked uræmic symptoms, remedies to act upon the various eliminative organs should be administered. Diaphoresis may be induced by hot vapor baths or by the wet pack. Pilocarpine or the fluid extract of jaborandi is sometimes necessary in urgent cases. To act upon the bowels, compound jalap powder or sulphate of magnesia are prompt remedies. The acetate and nitrate of potash may also be given on account of their diuretic qualities. During convalescence care should be taken to avoid excessive feeding or chilling of the surface. The urine should be frequently examined, and if albumen appears the milk diet ought to be resumed. Sponge baths, followed by an inunction of vaseline and carbolic acid, should be given daily. Iron and quinine or iron and chlorate of potash are indicated during convalescence in most cases.

Prophylaxis.—The most important means of preventing scarlatina are isolation and sterilization. The spread of the disease may be prevented to a greater extent than in measles, because it is not so contagious during the early stages. During desquamation the scales may be rendered aseptic by the inunction of carbolic acid—one part to a hundred of vaseline. Dr. Jamieson strongly advocates as complete sterilization as possible. He recommends as an application to the throat a saturated solution of boracic acid and glycerin, and to the entire skin, including the head, after warm baths, the following ointment: Carbolic acid, xxx gr.; thymol, x gr.; vaseline, 3j; simple ointment, 3j.

By the adoption of such measures an epidemic may be very much controlled.

MEASLES (Morbilli). (J. E. GRAHAM.)

Definition.—Measles is an acute eruptive fever, characterized by the presence of a papular rash and by more or less oculo-nasal catarrh. It is exceedingly contagious, especially attacking children, but is not exclusively confined to that class. It occurs very frequently in combination with whooping-cough.

Symptomatology.—The stage of incubation of measles generally lasts about ten or twelve days; but it may last from eighteen to twenty days in those who have been previously affected. In cases of inoculation the duration is shorter—from eight to ten days.

Invasion.—During this period there are two prominent symptoms—fever and coryza. In many cases a succession of chills occur, which generally last three or four days, followed by slight heat of the skin; or the disease may commence with one distinct chill. The pulse is increased in frequency but not in force. The child is often difficult to manage, and complains of light hurting the eyes. The vessels of the conjunctiva are congested, producing a red and somewhat swollen appearance. A clear, serous fluid is discharged from the nose. Epistaxis often occurs, and, though generally slight, is sometimes copious and frequent. The child is often troubled with a dry cough, which may be more or less of a croupy character.

These symptoms increase in severity during the first two or three days. The tongue is reddened and coated, but does not present any appearance peculiar to the disease. In some cases there are more or less redness and swelling of the fauces and palate, conditions which produce difficulty in swallowing. The child frequently complains of thirst, want of appetite, and more or less nausea. Sibilant râles are heard over the chest in many cases. Delirium is rarely present, and convulsions do not occur except occasionally in neurotic subjects. The disease is somewhat insidious in its onset, the patient complaining of slightly increasing *malaise*. In some cases, however, the onset is more abrupt, the disease being ushered in with vomiting, chills, fever, and pain in the back and head.

This stage lasts usually from three to five days, but in occasional cases may extend over six or eight, or even ten days, according to Trousseau.

Period of Eruption.—The rash frequently comes on in the night, and is first observed in the morning. It appears first on the forehead and at the roots of the hair as reddish dots, which in a few hours enlarge and become papular. It passes over the body from above downward, and completes its course on the second or third day. When fully developed, the papules frequently are grouped so as to form crescents, and are of a dull or deep red purplish color. More or less healthy skin is found between the patches. In some cases, however, the eruption is so confluent as to produce an almost universal redness, when the diagnosis between measles and scarlet fever may be somewhat difficult. In other cases, again, the papules are very discrete, and sometimes the eruption is wanting. There is more or less general swelling of the skin over the body, and this is more marked upon the face. Pruritus is often present. Miliaria are occasionally found, but not so often as in scarlatina.

As a general rule the evolution of the eruption is progressive, but in some cases there is a pause in the continuity of the process, which might give one the idea of two eruptions, one following the other. Early retrocession, when accompanied by remission of the general febrile symptoms, may be looked on as a favorable termination of the disease. But it must be remembered that early retrocession may be the result of visceral complications, and consequently of grave import.

During this stage there is an increased intensity of the constitutional symptoms until the rash has extended over the whole body. The coryza, which is always marked, lachrymation, and more or less conjunctivitis, form a very striking and diagnostic picture. The larynx presents a reddish appearance, and the vocal cords may be of a somewhat yellowish color. A certain amount of bronchitis is always present; and the cough, which is at first dry and hacking, becomes violent and often paroxysmal in character. The expectoration is at first clear and viscid, but in the latter part of this stage it becomes muco-purulent and sometimes nummulated. Diarrhœa is often present, especially during the first two or three days. The urine is scanty, and contains a large amount of lithates. Peptones and acetones are sometimes found. Albuminuria is also present occasionally, more frequent in adults than in children.

As the eruption fades away the general symptoms gradually disappear. The duration of this stage is usually from three to six days, and in many cases the rash commences to fade on the face before its complete extension over the body.

Desquamation begins on the sixth or seventh day of the eruption, commencing on the face and neck, and proceeding rapidly over the body. The scales are very fine, and much smaller than those of scarlet fever. During this stage the constitutional symptoms gradually subside. The cough and expectoration often continue throughout. A mild form of diarrhœa is sometimes present.

The whole course of the disease lasts usually from twelve to sixteen days.

The *temperature* in the stage of invasion is irregular, generally remittent in character, and sometimes intermittent. It rises rapidly during the first day to the maximum of this stage, then on the second day it falls

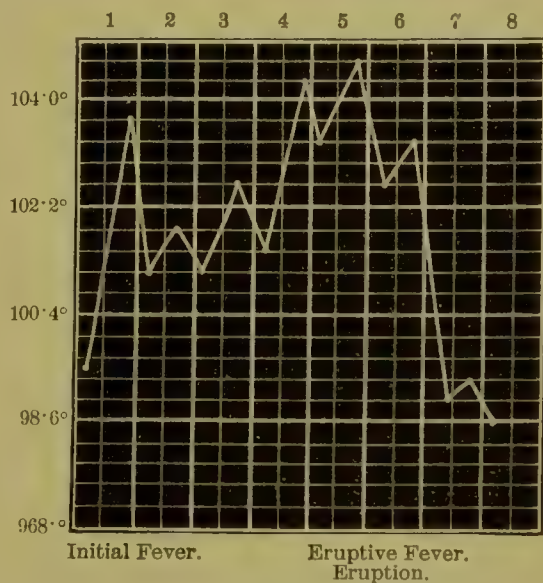


FIG. 16.—Measles (Strümpell).

two or three degrees, rising again when the eruption appears, and is at its height when the rash has extended over the whole body. The maximum temperature may be as high as 106° or 107° .

In some rare cases the catarrhal symptoms alone may be present without the eruption (*morbilli sine exanthemate*); while in others, again, equally rare, the eruption may be present without the catarrh (*morbilli sine catarrhe*). The diagnosis in such cases, especially when the rash is absent, is difficult and often doubtful. The course of such cases is usually very mild, lasting only a few days.

Malignant Measles.—The *nervous* or *ataxic form* is characterized by rapid pulse, 140 to 160; respiration, 60 to 80; dryness of the tongue; delirium; subsultus; urine scanty; skin dry and hot; temperature, 104° and 105° . The patients rapidly sink into a low typhoid state, and often die on the third or fourth day of the eruption.

The *pulmonary suffocative form* is marked by violent dyspnoea, cyanosis, frequent and irritative cough, râles heard throughout both lungs, and the respiratory murmur much weakened.

In the *hæmorrhagic form* (black measles) the rash is usually imperfectly developed, and of a livid or even black color. There is great general prostration, with twitching of the muscles, sordes collect upon the teeth and lips, and the tongue is dry and covered with a brownish coating. The pulse is rapid and feeble, respirations are hurried, and the extremities cold. Extravasations of blood may take place beneath the mucous and serous membranes, and blood may be discharged from the various orifices of the body. If one might judge from clinical reports, hæmorrhagic measles appear to have been much more frequent in former times than at present. It is possible that some of the older writers may have mistaken hæmorrhagic variola for a similar condition in measles.

Many cases of second attacks of morbilli have been reported. It is probable, however, that these do not occur as frequently as one might gather from statistics. No doubt in many instances cases of rubeola have been mistaken for morbilli.

Complications.—Laryngitis may occur in three different forms: First, a slight amount of inflammation, accompanied by spasms; second, a severe inflammatory condition; and, thirdly, inflammation accompanied by a pseudo-membrane. The first form is characterized by a hoarse cough and stridulous breathing, and usually terminates favorably, although some instances of sudden deaths have been reported. The second and third forms, in addition to the cough, are marked by severe and continuous dyspnoea, and sometimes œdema of the glottis.

A chronic inflammation of the larynx occasionally follows measles, the treatment of which proves very difficult. It disappears, and returns upon exposure, its presence being marked by hoarseness and more or

less cough. The inflammation sometimes passes down the bronchial tubes to the smaller bronchioles, resulting in capillary bronchitis and broncho-pneumonia. These two conditions, as a rule, occur together. They are marked by great difficulty of breathing, together with cough; and upon examination very fine moist râles are heard in abundance over a greater portion of the chest. This is an exceedingly fatal complication, and is one of the most frequent causes of death.

Lobar pneumonia occasionally exists as a complication of measles, but is not of such a fatal character as the catarrhal variety. It is usually the result of the invasion of pneumococcus, and can be diagnosed in the ordinary way.

Acute and chronic tuberculosis often follow these lung affections. The mucous membrane of the mouth and pharynx is usually red and somewhat swollen. It is at first dry, but afterward becomes moist, and covered with muco-purulent matter. This exudation ceases in a few days, leaving a peculiar spongy condition. Sometimes ulceration and necrosis of the mucous membrane may take place.

Otitis media, a result of the continuation of the inflammatory process through the Eustachian tube, may appear on from the fifth to the eighth day of the eruption, and is accompanied by pain and the accession of fever. It runs an acute course, rapidly perforating the membrana tympani, and resulting in more or less otorrhœa.

Conjunctivitis of a simple or ulcerative character is a common sequel of measles. Persistent diarrhœa, the result of follicular inflammation of the intestine, is occasionally met with. Vulvitis, both common and ulcerative, is sometimes noticed. Gangrenous inflammation of the mouth or vulva is a condition which occurs occasionally in poorly nourished children. Its course is very insidious, at first beginning as a small excoriation, after which the skin becomes hard and inflamed, and the gangrenous process extends. Endocarditis and pericarditis are rare.

Sometimes measles runs its course concurrently with other diseases. For instance, it may occur during the course of phthisis pulmonalis, and usually exerts a very unfavorable influence upon this disease, which very often progresses more rapidly after an attack than before. Simple albuminuria is occasionally met with, and nephritis may be present, but much less frequently than in scarlatina.

Convulsions are an occasional complication of measles. Their gravity from a prognostic point of view depends upon the stage in which they occur. At the commencement of the eruption in naturally nervous children they are not of such serious import. Later, however, they may indicate the commencement of broncho-pneumonia or otitis media, and, after the broncho-pneumonia is established, convulsions may arise from partial asphyxia, indicating the approach of a fatal termination. Perma-

nent effects upon the nervous system are not often met with after measles. Paralyzes, either cerebral, cerebro-spinal, or neural, have all been reported. The occurrence of diphtheria along with measles has been frequently noticed in hospital cases, but not so often in private practice. It may attack the patient during the second week, and, owing to the previously debilitated condition of the child, usually runs a grave course.

Sequelæ.—Whooping-cough occurs so frequently with measles as to give rise to the opinion that there is some connection between the two diseases. There is, however, no foundation for this idea. Cases when complicated by whooping-cough very frequently contract broncho-pneumonia and pulmonary tuberculosis.

The principal permanent lesions resulting from measles are chronic coryza and ozaena, conjunctivitis, ulceration and caries in the ear, necrosis of a portion of the upper or lower jaw, enlargements of the lymphatic glands, tuberculosis, dilatation of the bronchi, and abscess of the lungs. Of these, tuberculosis is most frequent, and may exist either in the glands of the neck or in the lungs.

Morbid Anatomy.—During an attack of measles the lesions of the skin are the result of the congestion and infiltration. There is also distention of the lymphatics around the vessels and hair-follicles, and slight infiltration into the rete mucosum. In the miliary form a colloid degeneration of the cells in the rete has been observed. The visceral inflammations are usually the result of secondary processes. The mucous membranes of the air passages are congested and sometimes infiltrated. Suppuration and occasionally ulceration follow. The lungs present lesions of broncho-pneumonia, which may be either the ordinary form in which the vesicles are principally involved, the interstitial, or the tubercular. The pleura is rarely affected, but the bronchial glands are frequently enlarged. The circulatory system usually escapes organic lesions.

Erythematous stomatitis is a common condition. A general hyperæmia of the mucous membranes of the intestine, attacking principally Peyer's patches and the solitary follicles, is a frequent post-mortem condition. In such cases the mesenteric glands are also frequently enlarged. No germ peculiar to measles has yet been isolated, but, as in scarlet fever, the most important fact so far substantiated is the frequent presence of pus organisms as well as the pneumococcus of Fraenkel, and the pneumobacillus of Friedländer.

Etiology.—All children are predisposed to measles; there is no natural immunity. It is rarely found under six months, partly because infants do not so often come in contact with other children. Its greatest frequency is between the ages of three and five years. Immunity is acquired after the first attack, although second and third attacks are more frequent than in scarlatina. Congenital measles has been rarely ob-

served. In two or three instances reported of infants born when their mothers had the disease, there were well-marked lesions of measles. (Gautier, Archives of Gynæcol., 1879; Lörner, Centralbl. für Gynæcol., 1889). Inoculation has been practiced, but with indefinite results, as the experiments are made during an epidemic. Successful attempts, however, have been made, in which the substance used was dry nasal mucus, tears, and blood, but none with the scales.

Measles is an extremely contagious disease. An affected child brought into a ward may spread the disease among others, and it is thus often communicated in the waiting-rooms of hospitals. It is contagious through the breath, dried mucus, exhalations from the skin, the blood, tears, nasal and bronchial secretions, the urine, and fæces. The disease may be communicated by means of bedclothing, letters, or other objects. In order to carry it from one person to another the contact must be long and intimate, and the interval short. Measles is contagious at all periods, from the commencement of the prodromal symptoms to the disappearance of the eruption. When complications arise, the period of contagion may be more prolonged. It differs from scarlatina from the fact that the disease is not so contagious during desquamation, and as the stage is much shorter, patients do not require to be quarantined for nearly so long a time.

On account of the great susceptibility of individuals, and of the contagiousness of the disease during its early stages, epidemics of measles spread rapidly, attacking a large proportion of those children who have not previously been affected. These epidemics usually occur every three or four years, as a new generation of susceptible children arises.

Diagnosis.—During the stage of invasion the principal diagnostic points are the presence of oculo-nasal catarrh and a dry cough, with rapidly increasing general *malaise*.

La grippe presents the same early symptoms, except that the peculiar rise and fall of the temperature which characterize measles is not present in influenza. In bronchitis the auscultatory signs appear earlier than in measles. Typhoid fever is accompanied by greater *malaise*, headache, and a more regular rise of temperature; oculo-nasal catarrh is absent. Measles is sometimes mistaken for variola, and cases of measles have occasionally been sent to smallpox hospitals. Variolous papules are smaller, harder, and more shotlike than those of measles; they do not occur in crescentic forms, and they invade the body more rapidly. In variola, too, there is severe backache, and absence of catarrhal symptoms. Rubeola may be distinguished from morbilli on account of its shorter duration, the polymorphous character of the eruption, and the lesser intensity of the oculo-nasal catarrh. In rubeola, too, the cough is often absent, and the glands in the neck are much swollen. Medicinal rashes,

such as those from antipyrine, chloral, quinine, iodide of potassium, etc., may be distinguished from measles on account of the absence of fever.

Prognosis.—The prognosis is very variable, ranging from three to as high as seventy per cent, depending upon the age and previous condition of the patient. Fatal results are more frequently due to complications than to the disease itself. Measles is very fatal among savage tribes, as has been shown by its fearful ravages among the inhabitants of the islands of the southern Pacific. The comparative mildness of the disease among civilized races may be due to some extent to hereditary partial immunity. The mortality under three years is greater than over six, nursing children excepted. Complications render prognosis more unfavorable. Hereditary tendency to tuberculosis, when present, increases the gravity of the disease. Capillary bronchitis and bronchial pneumonia are complications which often lead to fatal results. Trousseau reported an epidemic at the Necker Hospital, Paris, in 1845-'46, in which twenty-four children were attacked, and twenty-two died from this complication.

Treatment.—The disease is so mild in the majority of cases that hygienic means alone are necessary for its management. The sick-room should be well ventilated, and it may be necessary to keep it shaded, on account of the irritative effects of a bright light on the eyes. A constant temperature should be maintained, and too much bed-covering should be avoided. The patient should be sponged daily, and the skin anointed with boracic acid and vaseline. The diet should be largely of a liquid character, and water may be given freely to relieve the thirst. If there is much constipation, a mild laxative or an enema may be necessary. When diarrhœa is present, astringents may be indicated. In the malignant type it may be necessary to relieve the high temperature by means of cold sponging or the cold pack. In the hæmorrhagic form stimulants and supporting treatment are indicated. For the broncho-pneumonia the ordinary treatment for that disease should be adopted.

If the cough is troublesome, it may be necessary to give a soothing expectorant, or an occasional Dover's powder. During convalescence, if there is much anæmia, it may be necessary to give arsenic and iron. Care should be taken to prevent exposure to dampness or cold.

Prophylaxis.—For the prevention of the spread of measles the same means may be employed as have been spoken of in scarlet fever. Owing to the extreme contagiousness of the disease, these measures are not likely to be so successful.

RUBEOLA (Epidemic Roseola [German Measles, Rötheln, Rubeole]). (J. E. GRAHAM.)

Definition.—Rubeola is an eruptive specific fever, which, although it in many points resembles measles and scarlatina is still independent of either disease. The reasons for considering rubeola a distinct affection may be given as follows: 1. It has epidemic qualities apart from those of measles or scarlatina. 2. Its incubation, invasion, and eruption present symptoms differing from those of the two above-mentioned diseases. 3. It attacks indifferently, and with the same intensity, subjects who have already had measles and scarlatina. 4. It is produced only in those who are exposed to the special contagion of the disease.

Symptomatology.—The length of the period of incubation is not known—fourteen days according to some, from five to twenty-two days according to others. The stage of invasion is short—from a half to one day, one to three days, two to six days, as given by different authors. The constitutional symptoms are of feeble intensity, such as slight *malariae*, headache, pains in the extremities, and slight elevation of temperature. As a rule, symptoms of nervous irritability are absent, although cases of convulsions have been reported. A prominent symptom is the enlargement of the glands in the neck, particularly of those beneath the ear and in the posterior triangle—a condition which is accompanied by a feeling of stiffness and pain upon movement. In some cases the lymphatic glands in various parts of the body are enlarged.

The eruption generally comes on in the night, and may make its first appearance on different parts of the body, most frequently upon the upper half. The eruption is polymorphous, and varies in color and intensity. The papules vary in size from a pin's head to that of a lentil, sometimes sharply bounded, diffuse, irregularly disseminated, and often grouped, as in measles. The color of the patches is usually pale red, and disappears on pressure. The papules are frequently quite discrete on the palms of the hands and soles of the feet; a slight pruritus accompanies the eruption.

The rash presents two principal forms—that resembling measles and that resembling scarlatina; of these the former is the most frequent variety. The course of the eruption varies, and is sometimes very short, disappearing in a day, or even in less time. It often disappears in one situation while it is developing in another, and sometimes the eruption over the whole body will suddenly fade away, to be soon followed by another.

Catarrh of the mucous membrane is present in proportion to the amount of eruption. We have in rubeola the catarrh of measles combined with the angina of scarlatina; the catarrh is more frequently found in the conjunctiva; coryza is often wanting, and bronchitis rare. A gen-

eral swelling and redness are often found in the soft palate, pillars of the fauces and tonsils, while the patient complains of some dryness and difficulty of swallowing. Angina may exist alone, with coryza, or with conjunctivitis. Coryza and conjunctivitis may exist without angina. The catarrh generally develops more rapidly than the exanthem. The enlargement of the post-cervical and suboccipital glands continues and increases during the eruptive stage. The tongue is slightly coated; there may be nausea and vomiting. Some cases are apyretic. When there is a prodromal fever the temperature varies from 99° to 100° , and continues elevated until the eruption is fully developed.

Desquamation is generally rapid, and is often difficult to see, on account of the fineness of the scales.

Complications are rare, but pseudo-membranous angina, bronchitis, pleurisy, pneumonia, and albuminuria have been reported.

Diagnosis.—The principal diagnostic points are as follows: Shortness of the stage of invasion, with mildness of symptoms; slight intensity of the catarrh, and a combination of catarrh and angina. The patient attacked may have previously had measles or scarlatina, and the diagnosis may be confirmed by the presence of enlarged post-cervical and suboccipital glands.

In scarlatina the constitutional symptoms are more severe, the rash is more diffuse, and the tongue presents the peculiar strawberry appearance, while at the same time coryza and conjunctivitis are as a rule absent. In measles, on the other hand, there is the longer stage of invasion, a more marked coryza, the absence of angina and of swelling of the lymphatic glands in the neck.

<i>Scarlatina.</i>	<i>Measles.</i>	<i>Rubeola.</i>
Incubation, one to seven days.	Nine to fourteen days; average, ten days.	Five to twenty-two days.
Invasion, two days.	Four days.	One to two days.
Rapid rise of temperature.	Rise of temperature during first day, followed by remission.	Rise of temperature to 99° or 100° .
Angina without catarrh.	Oculo - nasal catarrh without angina.	Catarrh and angina slight.
Deeply furred tongue, with swollen papillæ.	Furred tongue.	Tongue slightly furred.
Constitutional symptoms severe.	Moderately severe constitutional symptoms affecting chiefly the respiratory system.	Constitutional symptoms slight.
Eruption, four to five days.	Four to five days.	About three days.

Scarlatina.

Measles.

Rubeola.

RASH.

Begins on the sides of the neck and front of the chest.	Begins on the forehead and face.	Rash commences on any part of the upper half of the body.
Rash, bright scarlet color, not raised above the skin.	Rash, papular, dark reddish color.	Rash of a rose-red color.
Sore throat increased in severity.	Catarrhal and bronchial symptoms increased.	Slight angina and conjunctivitis.
Desquamation, large-sized scales.	Small branny scales.	Very fine scales.
Desquamation lasts from two to four weeks.	Lasts four or five days.	Lasts two or three days.

COMPLICATIONS.

Nephritis, adenitis, formation of abscesses, purulent otitis, arthritis, general pyæmia.	Bronchitis, pneumonia, tuberculosis.	No marked complications.
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Etiology.—Rubeola is a disease of childhood. Its maximum frequency occurs between five and fifteen years, and is rarely found in adults. It usually exists in epidemics; sporadic cases are rarely found. It seems to be more prevalent in asylums for children and among the poorer classes. Adult age and previous attack give immunity to the disease. It may be communicated by simple contact; for adults, prolonged and intimate contact is necessary. It may also be conveyed from one house to another. The period of contagion is not exactly known. It is generally conceded to be more intense during the period of eruption, but may exist during any part of the disease. Second attacks are rare.

Prognosis.—The prognosis is almost invariably good; a few deaths, however, have been reported, the result of complications.

Treatment.—On account of the mildness of the disease no special form of medication is indicated, and ordinary hygienic measures alone are necessary.

VARIOLA (Smallpox). (J. E. GRAHAM.)

Definition.—Variola is an acute, contagious disease, marked by the presence of an eruption upon the skin which is first macular, then papular, vesicular, and pustular, and by severe constitutional symptoms, which

are most prominent during the periods of invasion and suppuration. The mucous membranes which come in contact with the air are also affected.

Symptomatology.—From a clinical standpoint, cases of smallpox are usually divided into four classes—the discrete, confluent, varioloid, and hæmorrhagic. We will first describe a case of moderate intensity, in which the eruption may be discrete upon the body, and to a slight extent confluent upon the face.

Invasion.—The disease is usually ushered in by a chill, followed by fever, less frequently by a number of slighter chills. In some cases the chill is preceded for one or two days by a temperature of 100° to 101° . The fever is generally intense, the temperature rising to 104° or 105° ; the pulse rapid, 110 to 120 in adults, and from 140 to 160 in children. One of the most prominent symptoms during this stage is severe pain in the back, which is felt in the lower part of the lumbar region, and occasionally passes up into the dorsal region, and downward to the lower extremities. The headache is generally frontal and often very intense, more intense, perhaps, than in any other condition except meningitis. There are marked anorexia and vomiting, and the tongue is dry, coated, and red at the sides and point. The face is often swollen and the eye suffused. Dryness of the nose and more or less of the phenomena of catarrh and angina are present. Epistaxis is frequent in children. The patient may be very much agitated, and convulsions are not unusual in children and nervous subjects. When these occur in the early part of the stage of invasion they are not of serious character, but when they appear immediately before the eruption they are of more grave significance.

In some cases, particularly in children, a cutaneous efflorescence or erythema occurs during this stage, which very often renders the diagnosis obscure. These rashes may be morbilliform or scarlatiniform in character, and are usually situated on the lower part of the abdomen or the inner sides of the thighs, front of the chest, and over the axillary region. The morbilliform rash often occurs on the second day, while the scarlatiniform usually appears later. In rare cases these rashes appear before the prodromal symptoms, or after the eruption commences. They are found most frequently in cases whose after course is benign, except when a hæmorrhagic condition accompanies a scarlatiniform rash, when the prognosis may be very grave. In some cases these rashes are the only manifestations of the disease (*variola sine eruptione*).

In a recent outbreak of smallpox in Toronto these rashes were present in two out of seven cases, the whole number affected. In one the constitutional symptoms were very severe, and the scarlatiniform rash appeared on the third day, spreading over a large portion of the body.

Upon the fifth day of the disease a few vesicles appeared, which were not umbilicated, and which ran their course in four or five days.

The constitutional symptoms become more and more aggravated until the commencement of the stage of eruption. Vomiting very often ceases after the first twenty-four hours but the backache and headache continue. The duration of the stage of invasion depends upon the severity of the case—from two to two and a half days in the confluent cases, and from three to five in the discrete form. On the third or fourth day after the commencement of the disease the eruption appears, when the symptoms diminish in intensity, the backache and headache disappear, and the patient is calm and breathes more easily.

The rash is first seen upon the forehead, around the roots of the hair, and about the mouth, nose, and eyes. It then passes down upon the trunk and over the extremities, and is usually complete in from twenty-four to thirty-six hours. In its development it is at first macular, then papular, vesicular, and finally pustular. The macules are round, reddish patches, which disappear on pressure, and are not raised above the skin. In a few hours they become papular, and the papules are distinguished by their hard, shotlike character, as felt when the finger is passed over them. Upon the third day of the eruption the papules upon the face, having become more prominent, present at their apices distinct vesicles. These increase in size until in twenty-four or thirty-six hours they have reached their maximum, when they present that peculiar umbilicated appearance which is their marked characteristic. The vesicles develop more slowly on the trunk and the extremities than on the face.

During this stage the recession of all the constitutional symptoms continues.

About the sixth day of the eruption the contents of the vesicles become purulent, a condition which is accompanied by general swelling and œdema of the skin. The pustules are fully matured by the eighth day.

The swelling of the mucous membranes of the mouth and throat depends upon the intensity of the eruption. In moderately severe cases the tongue is more or less swollen, slight salivation is present, and the voice may be husky, owing to swelling of the glottis.

The eyes are also red and swollen, sensitive to light, and more or less muco-purulent discharge is constantly present. Frequently the eyelids can not be closed on account of œdema.

The suppurative or secondary fever, which accompanies this stage, usually begins with a chill, followed by rise of temperature and increased rapidity of the pulse. The temperature may rise as high as 106° or 107° , and the pulse is increased in rapidity to 120 or 150 beats per minute. When the stage of desiccation commences there is an abatement of all the constitutional symptoms. This process usually begins on the twelfth

day of the disease, commencing on the face and proceeding over the body. During this stage there is a gradual diminution of the swelling of the skin, but a reddish surface remains long after the scabs fall off, and the skin does not resume its normal appearance for several weeks. When the tissue of the dermis has been destroyed cicatrices of the derma follow.

During the attack the urine is highly colored and of high specific gravity. Urea and the urates are increased in quantity; creatine, xanthine and tyrosin, and indican may also be present. There is a diminution of the chloride and an augmentation of the sulphates.

The temperature often begins to rise forty-eight hours before the initial chill, and on the second day it may rise to 104° and 105° , and remain stationary until the eruption appears. During the vesicular stage the temperature is nearly normal, but rises again during the stage of suppuration to 103° or 104° .

Confluent Form.—Severe constitutional symptoms mark the stage of invasion. The disease is ushered in by a chill, followed by very high fever, the temperature rising to 107° or 108° for a limited period, and then falling to 102° or 103° . The pain in the back is almost unbearable, and temporary paraplegia sometimes accompanies it. Vomiting is persistent, and diarrhoea is frequently present. At the commencement of the stage of eruption the face is diffusely red, and the rash may resemble measles to some extent. When the skin, however, is examined carefully it will be found to be made up of papules arranged closely together. By the end of the second day large flat vesicles develop which quickly coalesce.

The mucous surface of the mouth and pharynx are much swollen; salivation then commences, and forms a marked feature of this condition. Aphonia, cough, and dyspnoea are prominent symptoms. Diarrhoea and painful urination are sometimes noticed. During this stage the temperature falls, but the pulse remains frequent. The apyrexia is not complete, nor do the constitutional symptoms abate to the same degree as in the discrete form. The severe headache and backache may disappear, but the general feeling of sickness continues.

During the stage of suppuration the epidermis upon the face, which is raised in one mass, has the appearance of a mask of brownish color, and beneath it a discharge exists which has a horribly fetid odor. The face is so much swollen that the features can not be recognized, the lips are thick, the eyelids œdematous, closed, and adherent. During this time the salivation increases, and mucus of a tenacious character may collect in the throat, sometimes of a dark color, which the patient is not able to expel. The tongue is very much swollen, thirst intense, and diarrhoea often very troublesome. The urine is scanty and albuminous. The

temperature may rise to 104° , 105° , and even 108° . More or less delirium is present.

In this form a number of complications occur, such as bronchitis, pneumonia, pleurisy, etc. Death, which is the usual result in a great majority of cases, may take place at any period of the disease—during the stage of invasion from intensity of the poison, during the stage of vesiculation from suffocation produced by pulmonary œdema, or during suppuration from swelling of the mucous membranes of the respiratory tract, producing asphyxia, from pulmonary congestion, broncho-pneumonia, pyæmia, septicæmia, or cardiac collapse. In those who recover the process of desiccation is very slow, and the skin is permanently disfigured by cicatrices, and baldness is a frequent sequel. The convalescence may be delayed by the occurrence of many secondary conditions.

Variola Hæmorrhagica.—In this form the hæmorrhage may take place at any period of the disease—either during the stage of invasion, when it very often proves fatal before the appearance of the eruption, or during the stage of vesiculation; and a secondary form may take place in the suppurative period. A portion of the eruption may be hæmorrhagic, while other parts of the body remain unaffected. In this form pseudo-diphtheritic exudations are sometimes found upon the tonsils, mucous membrane, pharynx, and nose. At the commencement of this variety the constitutional symptoms may not be more than usually severe, and during its course the temperature is not raised in proportion to the frequency of the pulse; for instance, the temperature may be a little above normal, when the pulse ranges between 140 and 160. The constitutional symptoms present more or less of a typhoid character. The countenance is pinched and sunken, the breathing is rapid, delirium often present, and death usually occurs on the fourth or fifth day, the result of asthenia.

Varioloid.—This form occurs when there is a partial immunity either of a hereditary character or the result of inoculation, previous attack, or vaccination. The stage of invasion is usually prolonged, lasting over five or six days, and is often marked by the presence of prodromal rashes. The temperature often rises as high as in the unmodified form, but falls to normal when the rash appears. The eruption may consist of a few papules, which rapidly undergo vesiculation and pustulation. The development of the rash may stop short at any period, and the vesicles are often not umbilicated. The general symptoms subside when the eruption comes out, and rarely reappear during the stage of suppuration. The constitutional disturbance, therefore, after the stage of invasion is very slight and unimportant. The mild character of varioloid in comparison with that of true variola gave rise to the idea that they might be two distinct diseases. For the same reason varioloid has often

been confounded with varicella. Both these views are erroneous, as the most severe forms of the disease have been communicated by means of varioloid.

Variola in pregnant women is always a grave affection, and is usually more severe in proportion to the length of time in which pregnancy has existed. Abortion nearly always occurs after the third month in severe cases, and may be the result of separation of the membranes by hæmorrhage, or of the death of the foetus. In confluent smallpox abortion is the rule, and is usually followed by death. In the hæmorrhagic form a fatal result to both mother and child is to be expected. The frequency of the transmission of the disease from the mother to the foetus occurs in proportion to its severity. The following statistics have been published by San Gregorio: In seventy-two cases of smallpox in pregnant women there were thirty-one miscarriages and twenty-six deaths; in seven cases of varioloid there was but one death; in forty cases of discrete variola there were ten miscarriages and three deaths; and in twenty-two cases of confluent smallpox seventeen miscarriages and nine deaths occurred. Three cases of the hæmorrhagic form all proved fatal (Medical Standard, 1888).

Variola in children pursues a similar course to that in adults, except that the nervous symptoms are more prominent and the diarrhœa is more frequent.

Complications.—These exist in proportion to the severity of the eruption. The delirium which accompanies the disease may be the result of neurotic tendencies, of previous indulgence to excess in alcoholic liquors, or from toxins peculiar to the disease itself. Paraplegia occasionally occurs during the stage of invasion, and may be the result of the intense pain which is produced by the movement of the lower extremities, rather than from an organic lesion. It disappears during the stage of eruption. Occasionally myelitis and peripheral neuritis occur.

The variolous pustules may appear on the eyelids and conjunctiva, producing conjunctivitis and ulceration of the cornea. Iritis and chorioiditis may also occur. Inflammation of the external and middle ears are frequent complications. Endocarditis and endarteritis are occasionally found. Pericarditis may occur in the stage of eruption or suppuration. Myocarditis is one of the most frequent heart lesions, and is often the cause of sudden collapse. It may be accompanied by an excited or depressed action of the heart.

Œdema of the glottis may exist to such an extent as to produce asphyxia. The mucous membrane of the larynx is reddened, swollen, and ulcerated—conditions which result from the presence of vesicles and pustules in these situations. The larynx is often obstructed by the presence of sticky mucus. Bronchitis, broncho-pneumonia, croupous pneu-

monia, and pleurisy with suppuration, are the usual complications found in the lungs. Glossitis, tonsillitis, ulceration, and gangrene of the fauces and parotiditis are the pathological conditions most frequently found in the mouth and throat. The liver and spleen may both be enlarged.

Albumen is not often found in the stage of convalescence, nor is nephritis a frequent complication. Orchitis and ovaritis are sometimes met with. Inflammation of the joints, osteomyelitis, subcutaneous abscesses, boils, gangrene of the skin, and general pyæmia are occasional complications.

Etiology.—All cases of variola arise from contagion. The disease can be communicated directly or indirectly, most frequently in the latter way. Clothing, articles of furniture, letters, conveyances, etc., to which the poison may adhere, act as vehicles of contagion.

Infants are said not to be so susceptible to the poison as adults. A feeble state of health neither increases nor diminishes the receptivity. A patient suffering from typhoid is said to be not so likely to take smallpox during the presence of the fever. Natural immunity occurs in certain individuals and in certain families, while immunity may be acquired from having had a previous attack, by inoculation or vaccination. Second attacks of smallpox are rare, and, as a rule, not severe. The immunity arising from vaccination is not so great as from inoculation.

The disease is contagious at all periods, even during the period of invasion. One of the severest epidemics of smallpox which ever visited Toronto originated from a case of hæmorrhagic variola, when the patient died before the eruption developed. The contagion is at its maximum during the suppurative stage. The resistance of the germ of variola to destructive agencies seems to be very great. In China the scales used in inoculation have been known to retain their virulence for two years. In the recent outbreak of smallpox in Toronto the patient who was first affected, and who died of confluent form, lodged in the house where the disease existed two years before. No other source of infection could be discovered.

The poison generally enters the body through the organs of respiration, and not through those of digestion, and it is also inoculable.

The disease is frequently hereditary. A child born when the mother has smallpox may present the eruption at the time of birth, or it may develop two or three days afterward. Sometimes the child is free from the disease, and occasionally the mother, protected by vaccination, while but slightly affected, may give birth to a foetus with smallpox.

Epidemics can always be traced to the introduction of the poison, and were much more frequent in former times than at present. They are worse in winter than in other seasons of the year. The extent of the

epidemic depends upon the amount of vaccination practiced. This is a rule to which there is no exception.

The stage of incubation is eight to nine days after inoculation, and ten to twelve after contagion.

Pathological Anatomy.—The lesions upon the skin occur successively as papules, vesicles, pustules, and cicatrices, depending upon the stage of the disease. The papule is marked by a dilatation of the capillaries, and an increased number of cells in the rete mucosum. In each papule there is a center of necrosis, surrounded by swollen, granular, irregular cells of the rete, and these centers are found in the lower center of the rete between the papillæ. They soften, while at the same time there is an infiltration of the derma with leucocytes. According to Weigert, innumerable micrococci are found in these necrotic centers. In the vesicular stage there are a softening of the center, osmosis of plasma, and fusion of the cells. The fluid raises the corneous and granular layer of the epidermis, together with some of the upper cells of the rete. During this process, the cells become separated from one another, leaving trabeculæ, which divide the cavity into separate loculi. The umbilication which then takes place is produced partly by oozing through, and partial loss of fluid in the center, while the surrounding tissue is hardened and raised, and partly from want of elasticity of the trabecular bands. During the pustular stage the true skin is denuded of epidermis, and there is much infiltration of the derma with leucocytes.

Micrococci are found in large numbers in the cavities and on the surface of the papillæ, as well as in the lymphatic spaces. When supuration is complete the stage of desiccation begins. In discrete variola this process is rapid, and when the scab falls off the skin is left in a normal condition. When, however, there is much softening and breaking down of the epiderma, cicatrization results. In the hæmorrhagic variety an extravasation of red blood-corpuscles takes place into the vesicles.

Upon the mucous membranes there are three varieties of lesions—simple inflammatory, variolous pustules, and inflammation with pseudo-membranes. The general inflammation of the mucous membrane extends throughout the mouth and throat, while pustules form in the mouth and upper part of the œsophagus, very rarely in the stomach or intestines. The latter are also found in the larynx, trachea, and larger bronchi. Deep ulceration of the mucous membranes may result from secondary inflammation. Congestion of the lungs, lobular pneumonia, and pulmonary hæmorrhage, as well as myocarditis, are sometimes found. In the hæmorrhagic form extravasations of blood may exist in the various organs as well as the serous membranes. The liver, which is slightly enlarged, congested, and easily broken down, may be the seat both of parenchymatous and interstitial inflammation. Weigert has discovered

centers of necrosis in the liver. Necrotic centers have also been found in the testicle. The spleen is also enlarged, and generally firm and hard.

The blood is darkish-brown in color and coagulates with difficulty. White corpuscles are increased in number in the suppurative stage, and the red corpuscles do not form rouleaux, as in a healthy condition. The lymphatic glands are often inflamed. Many micro-organisms have been isolated, but none have been positively proved to be the germ of smallpox. The principal pus organisms are found in great abundance.

Diagnosis.—The diagnostic points during the stage of invasion are the high fever, rapid pulse, and severe pain in the back and head. The diseases with which it may be confounded during this stage are pneumonia, scarlatina, and erysipelas. In pneumonia the cough and respiratory symptoms are more prominent. In scarlatina we have the pronounced angina, while in erysipelas the reddening of the skin accompanies the constitutional symptoms. The presence of the prodromal rashes often render the diagnosis difficult. These rashes, however, occur principally upon the lower extremities, and are not accompanied by the characteristic symptoms of either scarlatina or measles. Cases of vaccination which are marked by high temperature, rapid pulse, and the presence of a scarlatiniform rash, present great difficulty to diagnosis, and a correct conclusion in some cases can only be arrived at after several days' observation.

During the stage of eruption, it may be necessary to diagnose variola from measles, pustular syphilides, the eruption of vaccination, acne varioliformis, varicella, medicinal rashes, and cerebro-spinal fever. Cases of measles have occasionally been mistaken for smallpox, and sent to isolation hospitals. In all cases where smallpox is suspected and a positive diagnosis can not be made, it is necessary to isolate the patient until the disease has declared itself.

A pustular syphilide, simulating smallpox, and complicated by pneumonia, where the previous history was unknown, once came under the author's observation. In such a case the diagnosis might be very difficult, but as a general rule when a knowledge of the previous history can be obtained no difficulty is experienced. Acne varioliformis and the medicinal rashes are easily distinguished on account of the absence of fever. In the earlier stages of cerebro-spinal fever the presence of severe pains in the back, together with a macular eruption, may suggest variola. But in a short time the further development of the malady will render the diagnosis comparatively easy.

Pathology.—The following quotation from Sydenham gives some idea of the views concerning the pathology of smallpox entertained during his time, and the reader can judge for himself as to the amount of progress that has since been made: "As to what may be the essence of smallpox I

am for my own part free to confess that I am wholly ignorant; this intellectual deficiency being the misfortune of human nature, and common to myself and the world at large. Nevertheless, when I carefully weigh the evidence derived from the above-named symptoms it suggests to me the idea of inflammation; of an inflammation specifically different from all others; of an inflammation both of the blood and humors. In clearing herself of this, Nature is at work during the first two or three days striving at the digestion and concoction of the inflamed particles, with the intention of afterward discharging them upon the surface of the body for the sake of maturation, and finally of expelling them from her boundaries under the form of little abscesses."

It will be noticed in the last sentence that Sydenham expresses ideas somewhat similar to those brought forward by the advocate of the theory of phagocytosis.

Treatment.—Cases of smallpox should, if possible, be treated in special hospitals, as it is exceedingly difficult to effect complete isolation at home. The patient should be placed in bed in a well-ventilated room, in which the temperature is constant, and the skin should be sterilized by the use of antiseptic lotions. If the temperature is high, cold sponging may be indicated. When this is not successful, the cold bath or pack may be used. During the stage of invasion it may be necessary to give sedatives. Opium was recommended by Sydenham, and either that drug or its derivatives are indicated. The headache may be relieved by phenacetine or by the application of the ice-bag. The vomiting may be relieved by small doses of cocaine, or by such sedatives as soda bismuth and hydrocyanic acid.

Great differences of opinion have prevailed as to the proper method of treating the eruption so as to prevent the subsequent forming of cicatrices. Upon this point Sydenham makes the following observation: "As to guarding against the face being disfigured by the scars I try nothing at all. The only effect of oils, liniments, and the like, is to make the white scurf slower in coming off." After a large experience, Dr. Osler arrived at a similar conclusion. He says, "The question of the prevention of pitting, so much discussed, is really not in the hands of the physician." There seems, however, to be a general consensus of opinion that the application of water in which an antiseptic has been dissolved is of decided service. Hyde recommends a solution containing a drachm of boracic acid, with one or two drachms of glycerin in a pint of warm water. Cloths should be wrung out and kept constantly applied. Dr. Welch recommends a mixture of equal parts of olive oil and limewater to be applied over the surface with a brush. Tincture of iodine applied during the papular stage has appeared in some cases to have prevented pitting.

One of the best applications for the mouth and throat is a saturated solution of boracic acid applied by means of a spray. A solution of borax in glycerin and water may also be used. Ice very often has a cooling and decidedly sedative effect upon the inflamed throat. It may be necessary to swab the mouth and throat with a saturated solution of boracic acid.

Special care should be taken that the eyes are kept as free as possible from irritating matter. To this end the lids should be cleansed with an antiseptic solution, and a mild antiseptic wash should be applied to the conjunctiva.

During the stage of suppuration stimulants may be necessary to prevent collapse. Sedatives such as bromide, chloral, and sulphonal are indicated if there is much delirium or insomnia. During the stage of convalescence the patient should be frequently bathed, and an ointment of vaseline and carbolic acid applied.

The anæmic condition which is so often present during the stage of desiccation is best combated by the administration of iron and quinine. The complications require to be treated in the ordinary way, care being taken that the general weakness of the patient should be duly considered in the adoption of medical or surgical measures.

Prophylaxis.—In order to prevent the occurrence of an epidemic of smallpox, it is of the utmost importance that an early and correct diagnosis is made of the first case. It is therefore necessary that a suspected case should be at once isolated until a correct conclusion can be arrived at. When the diagnosis of variola is positively made, the patient should be completely isolated, and all persons living in the house, or who have in any way come in contact with the patient during his illness, should be at once vaccinated. It is also of great importance that all persons who have been near the patient should be carefully watched, and, if symptoms of the disease show themselves, should be at once isolated.

The following brief history of an outbreak which took place in Toronto during the autumn of 1892 is an example of the ease with which the disease may be controlled in a community in which vaccination is generally practiced.

On September 12th a patient was admitted into the Toronto General Hospital suffering from a chronic cardiac and kidney trouble. He was in a febrile condition when he came in, and a rash shortly afterward appeared which proved to be confluent smallpox. The patient died during the suppurative stage, on September 25th.

The ward tender became ill on September 25th, and the eruption appeared on the 28th. He suffered from a moderately severe attack. The rash was slightly confluent on the face and discrete on the body.

The nurse, Miss C., presented febrile symptoms on September 26th, and the eruption appeared on the 29th. This proved to be a case of varioloid.

On October 12th, Dr. W., the resident physician, who was in frequent attendance upon the last two cases, became ill. He had chills followed by fever, and on the third day a scarlatinal rash appeared, which spread over nearly the whole of the trunk and lower extremities. On the fifth day this disappeared, and a few papules, about a dozen in number, were then noticed, which rapidly became pustular and underwent desiccation. They did not last more than a week.

When the papules appeared the constitutional symptoms entirely subsided. Dr. W. had been vaccinated when a child, and was revaccinated on September 26th, without result.

Dr. M., who had charge of the ward tender and nurse, was vaccinated on September 29th without any result, and on October 2d he tore off the dried blood with his finger nail, inflicting a slight wound. The part shortly afterward became inflamed, and in eight days, on October 10th, he was seized with chills and fever, and had an ordinary varioloid. About a hundred pustules appeared on different parts of the body. It is possible that Dr. M. inoculated himself on October 2d, and the disease appeared eight days afterward.

Dr. B., who practices in the suburbs of Toronto, called to see the two patients, the ward tender and nurse, on September 22d. He spent ten or fifteen minutes in the ward, and was not at any other time exposed. On October 6th he was taken ill, and the eruption appeared on the 11th. He also had varioloid.

After a positive diagnosis was made, all the patients in the ward were vaccinated, as well as all who in any way attended the patient. The patients were all removed to a pavilion temporarily constructed for the purpose. The first case only was fatal, and none were attacked except those already mentioned.

VACCINIA (Cowpox). (J. E. GRAHAM.)

Definition.—Vaccinia is a disease of well-marked characteristics peculiar to the cow and some other animals, the virus of which when introduced into the human system grants partial or complete immunity against variola. The disease never occurs spontaneously in the human subject, but is frequently found among cattle, especially milch cows. In 1765 Sutton and Fewster called attention to the properties of vaccine, but it was not until Jenner, in 1798, published the results of his observations that the profession generally became convinced of the value of vaccination. The practice then rapidly spread, so that in four or five years it was introduced into most of the European countries.

A certain proportion of individuals—about one in a hundred—enjoy immunity against vaccinia. Jenner was of the opinion that vaccination would grant the same amount of immunity against smallpox to the individual as would an attack of the disease itself. His grounds for this opinion were that they are one and the same disease. The immunity produced by vaccination may be complete or partial, preventing variola, or mitigating the character of the attack in those who become affected. The extent of immunity depends as a general rule on the character of the vaccine, and the thorough way in which the operation has been performed.

Symptomatology.—For the first two or three days after vaccination no change is noticed in the part, beyond the congestion produced by the operation itself. At the end of the second or during the third day a slight redness and swelling are noticed. Small papules then appear, which rapidly become vesicular. On the fifth day the vesicle is umbilicated, and surrounded by a zone of redness. On the eighth day vesiculation is complete, and the fluid is of a clear, serous character. At the same time the part immediately surrounding becomes hard and elevated, producing a ring called the areola, which is from one to three inches in diameter. At this time the constitutional symptoms are noticed. The temperature is elevated one or two degrees, the pulse is rapid, and the stomach and bowels may be deranged. There is also a feeling of general *malaise*. The axillary glands may be swollen. These symptoms vary much in intensity, but are scarcely ever entirely absent. The amount of urine passed by the patient during the stage of incubation is often increased. On the ninth or tenth day the contents of the vesicles become opaque, and then yellowish in color. Desiccation thereupon follows, and the general symptoms subside. On about the fifteenth day a hard, dry scab forms, which falls off about the twentieth day after the operation has been performed.

Varieties.—The appearance of the vesicle may often be retarded until the seventh or eighth day. This occurs more frequently when the vaccine is taken directly from the cow, or one or two removes. It may also be delayed on account of the incubation of other diseases. When the symptoms afterward appear in their regular order, the late development of the vesicle does not necessarily imply that the vaccination is ineffective.

On the other hand, vesiculation may occur on the third or fourth day. If the acceleration does not last beyond one day, and if the symptoms follow one another in the regular order, the vaccination is probably of a genuine character.

Sometimes in primary vaccination the vesicle undergoes an irregular development somewhat similar to that exhibited in revaccination. The vesicle may be developed in two or three days and the areola may not form. The vesicle also may become conoidal in shape and the contents opaque, not clear, as in the normal condition. A small scab forms rapidly and soon falls off.

3. These irregular conditions may be due either to the use of lymph, which on account of its age is to a certain degree inert, or to the previous health of the patient.

Mechanical irritation produced by a coarse sleeve coming in contact with the vesicle may cause an irregular form of development. It may be stated as a general rule that imperfect development of the vesicle and areola causes doubt as to the genuineness of the vaccination.

When a subject has once been vaccinated a second introduction of the lymph may not produce any general or local manifestations, or the course of the disease may be very much modified. In the latter case the vesicle is small, not umbilicated, and is surrounded by hard areola. The scab forms on the eighth day, and falls off early. The constitutional symptoms are sometimes severe, and the local irritation may be very great.

Complications.—Various skin eruptions accompany or follow vaccination, among which may be mentioned roseola, miliaria, lichen ruber, general vaccinal eruption, syphilides, and eczema. The roseola and miliaria usually develop on the tenth or eleventh day.

Cases have been reported of a general spread of the vaccine pustules over the body. No doubt in many instances these pustules were produced by the virus being conveyed from one part of the body to another by the finger.

The question of the possibility of the introduction of the virus of syphilis in connection with vaccine lymph has been set at rest by the experiments of the London surgeon who succeeded in inoculating himself with the syphilitic poison. When humanized lymph is used, great care should be taken that the child from whom the lymph is obtained should be free from syphilis, and also that no blood is incorporated with the vaccine lymph.

A series of cases of syphilitic inoculation were reported by Dr. R. W. Taylor, of New York, in which the same scarificator had been used and had not been properly cleaned.

An eczematous eruption may spread from the seat of the pustule, or matter from the pustule may be conveyed to a surface previously eczematous and suppuration be produced.

In some cases extensive sloughs form at the seat of vaccination, leaving deep ulcers, which are very slow in healing.

Often a raised patch of excessive granulation is formed in the seat of the vaccine vesicle. Occasionally an erysipelatous inflammation may attack the whole arm and spread to other parts of the body. Cellulitis, formation of abscesses, and general pyæmia are occasional complications.

It is theoretically possible that tuberculosis may be introduced into the system by vaccine lymph, but no well-authenticated case of this kind has yet been reported.

METHODS OF VACCINATION.

Some years after the publication of Jenner's articles the immunity produced by vaccination was so complete that the great discoverer was of opinion that in time smallpox would cease to exist. However, shortly after Jenner's death cases of variola in vaccinated persons occurred more and more frequently. This may have been due to the possibility that in

many instances the lymph was taken from cases of revaccination, or from those in whom the primary disease had run a spurious course. This, together with the well-established fact that other diseases may be communicated through humanized lymph, led to a return to the use of bovine virus, so that at the present time, on this continent, the latter is generally made use of.

Before the year 1866 vaccination with humanized virus was almost the universal practice in all countries except Italy. An address delivered by Dr. Palasciano, at the Medical Congress at Lyons, in 1866, and shortly after the discovery of a case of spontaneous cowpox at Beaugency, may be considered as the introduction of vaccination by the animal virus as it is now practiced. Dr. Martin, of Boston, in 1870 obtained virus from the 258th, 259th, and 260th of a continuous series from the heifer of Beaugency, and since that time vaccine farms have been established in many places, so that at present animal virus may be obtained easily and cheaply. Of the methods of operating which have been adopted, such as that by puncture, tattooing, and scarification, the latter is to be recommended as the best for the general practitioner. An ordinary lancet, or an instrument having four or five points, may be used. An abrasion is produced by cross scratches, and the epithelium is thus removed. When the cuticle is reached, as is shown by the slight oozing of blood, the lymph is spread over the raw surface and the part allowed to dry. Before the operation the arm should be washed with soap and water, and afterward sponged by a disinfecting solution. Care should also be taken that the instrument used is perfectly clean. In many cases, when a pustule forms, some means of protection against the rubbing of the rough clothing must be adopted. During the acute stage the patient should not be unduly exposed. The parents of children should be informed that vaccination is a disease of a mild type, and that similar care should be taken as in the other exanthemata.

THEORY OF VACCINATION.

Is the virus of vaccinia an attenuated form of that of variola, or is vaccinia an independent disease? This question has been discussed ever since the beginning of the present century, and is not yet positively settled. Many efforts have been made to introduce the virus of smallpox into the systems of cattle, both by inoculation and by causing them to inhale the contagion. These experiments have frequently been successful, but great differences of opinion have arisen as to whether the disease produced in the cattle was variola or vaccinia. The following instance would appear to prove the identity of the two diseases: Mr. Badcock (British Medical Journal, November 26, 1891), a druggist of Brighton, over fifty years ago succeeded in inoculating a heifer with the virus of smallpox. From the vesicles formed a child was inoculated, and from this a long

series of children. Typical vaccinia was produced in every case. Mr. Badcock afterward succeeded, out of two hundred attempts, in producing the disease in twenty-two heifers. From this many thousands of children were inoculated—typical vaccinia being produced, as before, in every case.

The theory of the identity of the two diseases is easily reconciled with our present ideas of the nature of immunity. In recent experiments immunity has in almost every instance been produced by an attenuated virus of the disease from which we wished to guard the patient. It rarely occurs that the virus of one disease renders the patient immune against another. The virus is in all probability due to the presence of a micro-organism, although the presence of a germ peculiar to this disease has not been established. In 1890 a report was read by Prof. Ernst, at the meeting of the American Association of Physicians, of preliminary experiments made by Dr. Martin, stating that children had been successfully vaccinated from the pure culture of a germ isolated from the vaccine lymph. A further report of the continuation of the experiments has not yet been made.

The amount of immunity obtained from vaccination varies according to the character of the virus used, the care with which the operation is performed, and the length of time which has elapsed since the last successful inoculation. It is probable that the human virus obtained after a series of careful and complete vaccinations is quite as powerful as the bovine virus. The latter, however, is to be preferred, on account of its freedom from syphilitic poison. The immunity depends also on the thorough way in which the system has been affected by the disease, as is shown by the following tables given by Marson :

Classification of patients affected with smallpox.	Number of deaths per cent in each class respectively.
1. Unvaccinated.....	35·0
2. Stated to have been vaccinated, but having no cicatrice.....	23·57
3. Vaccinated, one cicatrice.....	7·73
" two cicatrices.....	4·70
" three cicatrices.....	1·95
" four or more cicatrices.....	0·55
(a) Having well-marked cicatrices.....	2·52
(b) Having badly marked cicatrices.....	8·82
4. Having previously had smallpox.....	19·0

With reference to the question as to the extent to which puncture or scarification should be made, we would quote Dr. J. B. Russell's views as given by Dr. Hardaway: "The number of vaccine marks can have no meaning excepting so far as they indicate in a general way the quantity of lymph introduced into the system."

When the vaccination is done by scarification the number of vesicles required is not as great as that from puncture—probably three, the usual

number, is quite sufficient. In estimating the value of the vaccine scars, the character as well as the number should be taken into consideration. It is necessary that they present pitting similar to that found in small-pox. The length of time immunity exists after operation brings up the question as to how often a person should be vaccinated. The view generally taken is, that for continued immunity vaccination should be performed every ten years, and during the interval if the person has been exposed to contagion.

VARICELLA (Chicken Pox). (J. E. GRAHAM.)

Definition.—An acute contagious disease, affecting principally children, marked by the presence of slight fever, and by a vesicular eruption of the skin, which undergoes desiccation in three or four days. The vesicles come out in separate crops, so that while some are appearing others are fading away.

Varicella and variola were formerly considered identical, and the author has frequently heard Prof. Hebra strongly advocate the unity of the two diseases. It is scarcely necessary to repeat the arguments in favor of the separate character of the two diseases, as all English-speaking physicians, at any rate, have finally decided the matter in their own minds.

Symptomatology.—The stage of incubation is about ten days. The disease begins with a slight chill, followed by febrile symptoms, which are generally of a mild character, but occasionally may be quite severe. The stage of invasion does not usually last more than twenty-four hours; but very often the symptoms are so slight that the appearance of the eruption is the first indication of the presence of the disease. The eruption consists of vesicles or small bullæ, which are situated very superficially in the skin. These contain clear serum, and are surrounded by a reddish halo. They appear upon any part of the body, but are more numerous on the upper half, are discrete, and vary in number from twenty or thirty to two or three hundred. Within a few hours after the formation of these vesicles a number of papules may appear on other parts of the body, which in a few hours develop into vesicles. Two or three distinct crops of this character may occur during the course of the malady. The disease declines on the third or fourth day; sometimes papules abort before becoming vesicles. Usually the scabs fall off on the seventh or eighth day, leaving a reddened surface, and occasionally cicatrices follow.

The constitutional symptoms throughout are slight. Sometimes a scarlatinal rash precedes the appearance of the eruption. The mucous membranes are often affected, vesicles appearing in the mouth and throat, which quickly lose their covering, and terminate in superficial ulcers.

Mr. Jonathan Hutchinson has described a *gangrenous form of varicella* which occurs more particularly in delicate children who have a tendency to tuberculosis. Sometimes the vesicles become enlarged and of a bullous appearance, and occasionally the eruption is attended by intense itching. Extravasation of blood has taken place in some cases. Pemphigoid eruptions sometimes follow varicella, and are very persistent. Simple and ulcerative stomatitis have been known to complicate this disease. Secondary affections are very rare indeed, but cases of pleurisy, polyarthritis, pneumonia, and nephritis, have been recorded.

Etiology.—The disease is rarely found in children under six months or after ten years of age. The maximum frequency is at about three years of age. The first attack generally produces immunity. It may, however, occasionally occur twice. It is less contagious than variola, and is not so readily conveyed on clothing. It may be produced with inoculation, but with difficulty. It may exist sporadically or in epidemics, usually in the latter way. In large cities the epidemics are not separated by intervals of two or three years, as is the case with measles, but may occur every six months or year.

Diagnosis.—The diagnostic points in varicella are the slightness of the prodromal symptoms, the appearance of the rash upon different parts of the body, the absence of umbilication, and the occurrence of successive crops of vesicles. The diagnosis from variola is very important. This, however, is rendered easy by the fact that varioloid, with which varicella is most likely to be confounded, has usually a long stage of invasion, in which the constitutional symptoms are very severe. The superficial and vesicular character of the eruption, as well as its appearance in separate crops, aid to distinguish it from varioloid. Notwithstanding these points of difference, cases occasionally occur which puzzle even experienced physicians; and an epidemic of varioloid has been known to be mistaken for varicella. Varicella may be mistaken for some of the noncontagious eruptions—dermatitis herpetiformis, urticaria, scabies, etc. From these the distinction is made by the more acute character of the varicella, and by its being accompanied by more or less febrile movement.

Prognosis.—The prognosis is almost invariably favorable. Trousseau says no physician has ever seen a child who has died of chicken pox. In a few of the rarer variety of cases fatal results have been reported; but fatal complications are usually quite independent of the exanthematous fever.

Treatment.—The treatment is purely hygienic; children with varicella are safer in bed, as they can in that way be prevented from exposing themselves. Patients should be prevented from irritating the lesions, as they may induce an inflammatory action, which will be followed by ulceration.

ERYTHEMA. (GEORGE T. ELLIOT.)

Under the designation of erythema, many forms of cutaneous disturbance and disease are included, which, characterized especially by redness, are, on the one hand, only the result of hyperæmia, and, on the other, due to inflammation. The line of division between hyperæmia and inflammation is, however, by no means a strict and definite one, inasmuch as the former will frequently become transformed into the latter, and in making, therefore, a distinction between a hyperæmic and an inflammatory erythema, only clinical convenience is sought, and the absolute pathological separation of the two groups should not be taken in too strict a sense. Upon the basis mentioned, erythema will therefore be separated into the two groups of *erythema hyperæmicum seu simplex* and *erythema exudativum*.

ERYTHEMA HYPERÆMICUM SEU SIMPLEX. (GEORGE T. ELLIOT.)

The examples of erythema contained in this group do not represent distinct specific diseases having only one etiological cause, but they are the result of most diverse factors, any one of which may, at different times and under suitable conditions, produce in an individual the symptomatic manifestations representing the erythematous process. This form of erythema is often physiological and of no pathological importance, but, owing to its resemblance in certain of its phases to more serious diseases, its recognition is frequently of value and of grave necessity.

So far as its general characteristics are concerned, we find that the majority of cases have favorite points of localization, without, however, being limited to these, and that the eruption may be partial or general in extent. The redness may be diffuse and fade gradually out into the surrounding skin, or it may be constituted by macules, a pea to a finger nail in size, discretely distributed, but often touching at their edges and producing a dappled appearance, as in roseola. In children, the erythema is often punctate and resembles strikingly a scarlet-fever rash. All degrees of redness are met with, the color of the manifestations varying from a pink to a bright or deep red, and on pendent portions, it may be a dark or a livid red. It may also become bluish or cyanotic, when venous congestion predominates.

Pathologically, erythema simplex in general is a blood-vessel dilatation brought about by a disturbance of the vasomotor nerves. Whether it is due to inhibition of the vasoconstrictor nerves, or to their irritation to a point of exhaustion and the production of an angioparesis, is, however, still an unsettled question. Probably both modes of origin are concerned, for we see erythema as the result of purely local causes, of internal toxic and of other agents, and also originating in a reflex manner.

Erythema Pudoris et Iracundiæ.—This form of erythema simplex needs only mention, as it is that physiological redness, which, under the influence of the emotions, appears upon the cheeks, the neck, the ears, the forehead, and the upper portion of the chest and back. Eulenberg claims, however, that it may be pathological. Under such circumstances, it appears after severe exercise, eating, heat, psychic influences, etc., and persists for hours, with local elevation of temperature, a feeling of anxiety, increased cardiac action and irregular pulse. It begins usually in childhood and gradually increases in intensity, but disappears with age. Such cases are not infrequently seen, and “chronic blushers” as they may be termed, often complain of the mortification they experience from their infliction. Eulenberg states that it may predispose to melancholia, and ascribes its existence to a congenital predisposition to excessive irritability of the nerve centers. He recommends for its treatment, bromide of potassium, ergotin, digitalis, cold baths, and hydrotherapy.

Erythema Neonatorum.—It develops shortly after birth as a diffuse universal redness, unaccompanied by any local elevation of temperature, or disturbance of the systemic health. At first pale red, it reaches its maximum in three to four days and then fades away without desquamation. It rarely persists beyond the first week of life. During its involution, a yellow color, resembling that of icterus, may become apparent and in very severe cases there may be petechia. Among its causes, external irritation from manipulation of the young and tender skin may be mentioned, as well as bathing and the pressure of the clothes, the external atmosphere and temperature.

Erythema Traumaticum.—A diffuse redness, which, limited to the seat of injury, disappears spontaneously after removal of its cause. When the irritation has been long continued, inflammation may ensue, or a predisposition may be acquired to the development of some other disease, and eczema, bullous and pustular eruptions may arise, or ulceration, sphacelation, etc., result. Persistence or repeated renewal of the cause may and frequently does produce a certain degree of pigmentation.

It originates from mechanical insults and is produced by more or less long contact with irritating substances, with nasal, salivary, or sudoral secretions, or with leucorrhœic discharges. In infants, the prolonged application of diapers or napkins wet with urine or covered with feces may lead to its development, as is shown by certain forms of intertrigo. Other causes may be pressure from the clothes, especially around the waist, from garters, etc., and it also occurs over the tubera ischiorum from long sitting, or on the sacrum from lying on the back.

In itself, erythema traumaticum is of little or no pathological impor-

tance. The locality upon which it constantly occurs may, however, be more intensely affected than the rest of the surface, if some eruptive disease or other supervenes. The eruption of smallpox, measles, scarlatina, etc., is thus apt to be especially marked around the waist and on those regions subjected to frequent or constant hyperæmia. It is also well known that in scabies, similar localities are particularly affected, as on the buttocks, when the patient's occupation requires constant sitting down, or on the thigh in shoemakers, etc.

Erythema Caloricum.—Its causes may be cold as well as heat. The redness may be due to the heat of the sun, or of a fire, or from exposure to the air. It is usually diffuse and limited to the parts exposed, and disappears spontaneously when exposure to the causal factor ceases. Occasionally, it becomes chronic in type and persistent. Pigmentation is a usual result when the exposure has been repeated, but it disappears gradually after cessation of the inducing factors. In cooks, stokers, and women, who toast their lower extremities at the fire, erythematous rings and gyrate patterns may form on the front of the legs. Primarily of a deep red color, they gradually become browner; but when the shins are no longer exposed, the redness fades and only deep brown ringed pigmentation is left, and remains more or less permanently (*erythema ab igne*, Crocker).

Cases in which there was a peculiar susceptibility to the sun have also been recorded, but, in view of recent investigations on the influence of sunlight on the skin (Hammer), they were possibly due to idiosyncrasic reaction to some of the color rays of the spectrum. Erythema is thus mentioned as occurring immediately on exposure of the hands, face, and other surfaces to the sun, and to disappear spontaneously in an hour or so after returning indoors. Such cases were not influenced by the heat of a fire, and developed in winter as well as in summer.

Erythema hyperæmicum from cold is of common occurrence. It also leads to pigmentation. When the exposure is of some duration, the coloration may be bluish, livid, and even cyanotic, from the predominance of venous congestion.

Erythema Intertrigo.—Some authors include intertrigo among the erythemata, regarding it as a simple hyperæmic condition produced by friction of two surfaces lying in apposition, or due to moisture and heat, or to napkins wet with urine or diarrhoeal discharges. It is located especially in the inguinal regions, but in infants also in the folds about the neck, the wrists and legs. In stout people, it is found in similar situations and likewise beneath the hanging breasts of women. It is described as a diffuse redness, sometimes accompanied by a muciform or

purulent exudation. Crocker claims that the pathological process is not an eczema, for the reason that the exuded fluid does not stiffen linen. The writer would grant that some of these cases should be included in erythema—erythema traumaticum—but, on the other hand, there are many others occupying the same localities and which present much the same symptoms, but which can be distinguished clinically from each other. Some of these are inflammations, others are eczemas and due to irritation or to parasitic agents. A very common form, in his experience, is represented by dermatitis seborrhoica, and under this heading it will be found described.

The treatment of those cases which are truly erythemata, is limited to the removal of the inducing cause, the separation of the two contiguous surfaces by means of absorbent cotton or sheet lint, and the use of some drying and hygroscopic powder, such as lycopodium, starch, etc., or \mathcal{R} Zinci oxidi; magnesiæ carbonat.; salol; amyli, āā 3j. M. et S. For the treatment of those other instances, which are eczematous or parasitic in nature, the remedies called for are such as are in use in eczema in general, and reference to the article on that disease, and to the one on dermatitis seborrhoica, should be made.

Erythema Læve.—The term was formerly applied to the redness frequently occurring on œdematous limbs. The part is swollen, red, tense and shining. Vesiculation and ulceration may result, unless the tension is relieved. Inflammatory changes may ensue readily, and there is a predisposition to eczema. Not infrequently, it is a primary though transitory symptom of cutaneous vascular disturbance, as when there is a varicose condition of the veins, but inflammation speedily supervenes.

Erythema pernio receives due attention in the chapter on Dermatitis Calorica.

SYMPTOMATIC ERYTHEMA.

There are certain forms of erythema simplex which are purely symptomatic manifestations and accompany some febrile or other disease, or originate from an idiosyncrasy on the part of the individual toward various substances. These erythemata are due to unknown causes, or to high temperatures, or to irritation of the vasomotor centers.

Erythema or Roseola Infantilis.—It owes its origin to gastric derangements, intestinal worms, or dentition, or it arises during the course of a bronchitis, a pneumonia, a meningitis, etc. The eruption consists of small macules, or of a punctate rash, distributed especially over the trunk and to a lesser extent over the face and the extremities. It may persist only a few hours, but sometimes remains a day or two, disappearing, how-

ever, without desquamation. Sometimes the eruption resembles that of measles or scarlatina, but the course of the temperature, the absence of respiratory, throat, or renal changes, etc., are sufficient to characterize it as an erythema.

Erythema Medicamentosum, or the erythematous eruption produced by the ingestion of certain drugs, belongs more properly in the chapter on Dermatitis Medicamentosa, and the description of *erythema variolosum* is included in that of variola. The scarlatiniform erythema is described separately.

Erythema Vacciniforme.—It may appear one or two days after vaccination, or not until the eighth or the ninth day, when pustulation is beginning. It occurs in the form of isolated macules, which may coalesce to form more or less large patches, distributed over the trunk and the extremities. The outbreak is accompanied by some febrile reaction, but desquamation does not follow its disappearance.

ERYTHEMA SCARLATINIFORME.

The French school of dermatology of to-day, represented by Besnier, Brocq, and others, would divide the pyretic and pseudopyretic erythemata into two classes—the scarlatinoid and rubeoloid, and the desquamative scarlatiniform. They would separate them for the reasons, that the former simulates more nearly true scarlatina by the rapidity of its invasion, high febrile reaction, mucous membrane and visceral implication, and by the possibility of grave results. They are said to be always *secondary*, developing during the course of some infectious disease, or as the result of autotoxæmia, or of deuteropathic, medicinal, or food toxæmia. The eruptions, which they term *scarlatiniform*, are, on the other hand, more often subacute, though they may be acute. They are pyretic at their inception, or during a part of their course. They are often prolonged beyond the extreme limits of the exanthemata, and have a tendency to relapse. They occur without any apparent definite cause, or they are of artificial origin—medicinal, or from external irritation. Brocq also would make these latter a benign form of pityriasis rubra.

The rationale of making these two classes upon the bases of their acuity, pyrexia and duration, is by no means evident, and the advantage gained not at all apparent. Degrees of acuteness, high and low temperatures, short and long duration, are features belonging to every disease. It would, moreover, appear natural to expect higher febrile reaction when the eruption developed in association with an already pyretic process—septicæmia, pyæmia, toxæmias of various kinds—and the acuity of the clinical symptoms would also vary according to the intensity of the toxæ-

mic inducing cause, whether it be of medicinal, food, or of other nature. Individual predisposition would likewise lead to variations; while the basic pathological process in each of a series of cases would necessarily stamp upon each this or that difference in duration, clinical manifestations, extent or intensity of course, notwithstanding that the pathological origin of the cutaneous symptoms might be the same in every one—that is, the manner in which any etiological factor acts in the production of the erythema may be the same, but the results of its action must necessarily vary according to its intensity, to the presence or absence of some other disease, or to the degree of individual idiosyncrasy, etc. The further statement, that the scarlatinoid erythemata are always secondary to some intoxication, does not exclude the scarlatiniform erythemata from the same accusation. We find, for instance, that the *same drug or other etiological factor* is mentioned as causing both the scarlatinoid and scarlatiniform type; and that being the case, why should the former eruption be “secondary,” and the other not?

For these reasons, it appears to me that a distinction between scarlatinoid and scarlatiniform erythema is a refinement, which only complicates the subject, without adding in any way to our true knowledge of the pathological status of the process, and, in consequence, the description of the symptomatology of both of the forms, artificially distinguished, in my opinion, will be given conjointly.

Definition.—Scarlatinoid or scarlatiniform erythema is a noncontagious symptomatic eruption, which simulates in its cutaneous manifestations true scarlatina, but differs from it in not having a specific, but many and most diverse causes. It is characterized by the appearance of a punctiform or diffuse red rash, which resembles that of true scarlatina, and is followed by desquamation. In many cases there is a tendency to the recurrence of the disease occasionally or repeatedly.

Symptomatology.—The symptoms referable to the general system, which precede the appearance of the rash, may be those of the disease or pathological condition in the course of which it develops, or the somatic disturbances existing may be intensified, or the temperature become more elevated. If the erythema appears when such disease or conditions are not present, its onset may be brusque and without warning; but more often there is *malaise*, chills, febrile reaction— 100° to 103° or more—and general constitutional disturbance preceding its evolution. If the process, which it complicates, is a pyretic one, the temperature will run the course of that disease; but in the other cases it subsides rapidly, though sometimes it may be of a continued or remittent type. The rash either appears suddenly, or in a few hours to two or three days after the inception of the prodromal symptoms. It has no particular locality for its first appearance, but it may manifest itself upon any portion of the

body. In a great many cases the face remains free, but the eruption may extend over the entire body, or it may be partial. In one of my cases, the first attack was universal, but all the subsequent ones were limited to the hands and feet. It may also appear here and there in patches, which later fuse together to cover large areas, or even to become universal. In every case, the extension is rapid, and it only requires a few days or less to occupy wide territory or the entire cutaneous surface. The eruption may be a diffuse one, or punctiform in character. It is usually of a bright scarlet-red, but in various cases any shade of red may be seen. Occasionally it is accompanied by œdematous swellings or petechia. Miliaria vesicles may also form. Subjectively, there is burning, pricking, and especially itching, but these may be absent, or of short duration, though sometimes marked.

The rash subsides rapidly in from one to six days, being usually followed by desquamation, but in some cases this may be absent. Besnier, however, states that scaling will always be found on the articular surfaces, at the bend of the elbow, etc., even in those instances in which it is not manifested on the rest of the body, or when the desquamative stage is delayed. Desquamation is also said to occur on those parts which had not been the visible seat of the eruption. It begins about the third to the fourth day, even before the redness has completely disappeared, manifesting itself primarily upon the surface, which had been first attacked. The scaling may be furfuraceous, or abundant and lamellous. The entire epidermis of the hand may be exfoliated as a glove. The skin underneath may be unchanged, or slightly reddened. The desquamative stage is of variable duration, depending somewhat upon the severity of the attack. It may last a week or two, but more often it ceases gradually in from three weeks to two months. Occasionally, the hair and the nails are shed.

As complications, arthralgia and arthropathies are mentioned, and also pulmonary, cardiac and pericardiac affections, and intestinal catarrh, etc. These conditions should be regarded, however, as more probably the provoking causes of the erythema, or the result of the agents or processes which produced it, rather than consequences or phenomena constituting a part of the symptomatology of the erythematous eruption.

During the febrile stage, the tongue may be coated, or it may be reddened at the end and on the sides. In cases of my own, it has several times been smooth, as though denuded of epithelium, the patients themselves mentioning the fact. The gums are sometimes red and swollen, and the fauces more or less reddened. There may also be some exfoliation of the epithelium. The nasal mucous membrane and the conjunctiva are sometimes affected. There may only be one attack of the erythematous eruption, but in many cases there is a tendency to relapse. The re-

currences may occur at long intervals, being separated by periods of entire quiescence, or they may be repeated and at short intervals. No rule can be laid down in regard to these relapses, but the eruption may reappear whenever the inducing cause in any given case comes into play; and also, having once occurred, the process may recur repeatedly and apparently in an idiopathic manner. There is no limit to the number of relapses which may occur. Tilbury Fox mentions a case which had had a hundred attacks. The relapses may likewise occur at such short intervals as to cause the process to appear to be continuous. The recurrences are often much less severe than the primary attacks.

Pathology.—The pathology of scarlatiniform erythema is obscure, and the manner in which the various inducing causes produce their effects is certainly unknown. Whether it is from a disturbance produced in nerve centers by a medicinal, alimentary, or other substance for which they have an inherent intolerance, or whether it is due to their irritation by some poison circulating in the general system, are questions still to be solved. It may be that the causal factors act in a local manner on the blood-vessels or nerves of the skin. In many instances the production of the process is evidently through reflex action, as it was in a personal case, the exciting cause being a pathological condition of an internal organ. Whatever its causation may be, in these erythemata individual predisposition or idiosyncrasy plays a most important rôle, and we may see in an individual the same process originate from several or more causes. Variations in the intensity of an attack may possibly depend also upon the degree of predisposition (Besnier).

Brocq believes that the desquamative scarlatiniform erythemata are benign forms of pityriasis rubra. I have already stated that there was no valid reason for separating the process into the scarlatinoid and scarlatiniform, and still less can I see any reason for considering them as forms, benign or otherwise, of pityriasis rubra (Hebra). I have had the opportunity of observing closely for years cases of this disease, and their course and general symptomatology—except desquamation, redness, and loss of hair and nails, which latter occur sometimes in the erythemata—were so absolutely different in most important particulars that it does not seem possible to consider both as in any way referable to the same pathological process. The only category in which scarlatiniform erythema should be included, in my opinion, is in that of symptomatic erythema.

Etiology.—In some cases the inducing cause, either of an attack or of a relapse, is not ascertainable. In others, the eruption appears as a reflex vasomotor disturbance after the wounding of portions of the body rich in nerves, or it develops twenty-four to forty-eight hours after severe wounds and operations, supposedly owing to the absorption of wound secretion, or particles of destroyed tissue elements or fibrin ferment

(Hoffa). Winiwarter mentions also that these scarlatiniform eruptions were much more frequent before the days of antiseptis. After a peritonitis, not septic in nature, or a puerperal peritonitis, septicæmia, pyæmia, gonohæmia, it has also originated and it has been seen in the course of variola, typhoid fever, diphtheria, etc. It has developed frequently in connection with rheumatism and in the ague of young children, showing the same tendency to periodic return as is seen in intermittent fever (Cheadle). Uræmia, tuberculin injections, ptomaine auto-intoxications, are also mentioned among its causes, and likewise sewer-gas poisoning (Crocker). In a personal case, the cause of the eruption, which appeared with every menstrual period, was apparently a prolapsed and enlarged ovary. Certain kinds of food—shellfish, fruit, vegetables—at times produces it. It has appeared after the administration of anæsthetics, and also from alcoholism, the ingestion especially of mercury, but likewise of quinine, opium, the salicylates, belladonna, copaiba, antipyrine, etc., and from carbolic-acid poisoning. Among external causes, mercurial inunctions should be particularly mentioned, and also great heat, sea baths, the sun, and also mineral waters. The inducing factor may possibly be the season of the year, as in a personal case, in which the first attack was in the month of May, and relapses occurred in the same month during three successive years, entire freedom being enjoyed in the interval.

Diagnosis.—The diagnosis of the scarlatiniform rash is important. It has undoubtedly furnished many of the cases of wound scarlatina as reported in former days, and also certain of those instances of several successive attacks of scarlet fever. From well-marked cases of the latter it is, however, easily recognized; for the throat, though reddened, is not swollen, the strawberry tongue is absent, the constitutional disturbances are only slight, unless the erythema is a symptomatic manifestation of some severe general disease. Nephritis is also absent, but occasionally albumin may be found in the urine, though it will be difficult to decide whether it is due to the erythema, or whether pre-existing, or the result of some other cause. More value should be placed in such cases on the microscopic evidences of nephritis, than upon the presence of albumin by some test. The early desquamation will also clear the case up, as it commences on the third or fourth day, while that of true scarlatina begins generally about the tenth day.

Prognosis.—The prognosis will vary according to the nature of the inducing cause. It may be grave and indicative of death when it appears in the course of a pyæmia, a septicæmia, or a puerperal peritonitis, but yet not always. The results may also be serious, owing to the intensity of the attack. If the erythema is the result of an idiosyncrasy toward ingesta of some kind or other, the prognosis is favorable, but,

nevertheless, it must be remembered, that relapses may recur from other than the repetition of the original inducing cause. It is difficult to say whether relapses will ensue, or, if they do, how many in number they will be. No definite answer may be given to these questions, nor may any promises be made in regard to ultimate and entire cessation of the process. It may cease reappearing under the influence of any cause whatever, but how or when this may happen cannot be said.

Treatment.—As regards the eruption itself, no particular line of treatment is to be followed. The measures made use of must depend upon the symptomatic indications furnished by the functional condition of the patient, or by the nature of the systemic disease of which the erythema is a symptom. Externally, any simple ointment is recommended, or almond oil. Powdered starch may be used, or recourse be had to alkaline or emollient baths.

ERYTHEMA EXUDATIVUM MULTIFORME. (GEORGE T. ELLIOT.)

Definition.—An inflammatory disease of the skin, characterized by erythematous efflorescences varying in form and arrangement, and usually localized upon the backs of the hands and the forearms, the dorsum of the feet, and on the legs, the face, and the neck. They may, however, occupy other parts and even the entire body.

Symptomatology.—There are certain general and constitutional symptoms, which may precede the appearance of the eruption, or which may arise during its course. These may also vary according as the skin manifestations develop during the existence of some general disease, or in an apparently idiopathic manner. When the former is the case, the symptoms immediately ushering in the eruption will only be those of the general disease which they accompany, and they may remain unchanged, or perhaps suffer some degree of aggravation. In the latter case, however, there may be prodromal disturbances of various kinds, though not in all instances, preceding the outbreak of lesions on the skin by a few hours or several days. Elevation of the temperature may thus be absent altogether, or it may be moderate, or again severe, rising slightly or to 103° or 105° , according to the extent of surface affected. In type and duration the fever will present much variation, but the eruption generally appears when it has attained its maximum. The temperature then gradually declines and becomes normal in the course of a few days, though it may persist until new lesions have ceased to appear. Other prodromal symptoms are general *malaise*, pain in the back and limbs, headache, gastric and intestinal disturbances, etc. The occurrence of enlarged spleen is mentioned by Crocker as occurring in some cases.

Localization.—One of the most striking and constant features of erythema multiforme is its localization. Almost invariably the lesions appear first on the backs of the hands and extend to the forearms, and then to the lateral portions of the neck and the face. Frequently simultaneously, but more often later than on the hands, the eruption is manifested on the dorsum of the feet and on the anterior aspects of the legs. It is, however, frequently absent altogether from these regions, and, besides, the eruption will present much variation in individual cases. Thus, the lesions may appear first on the face and then on the hands, or they may extend to the upper arms and the thighs and to the trunk, and the process may even become universal. Pick and Lewin have recorded cases in which the eruption was limited to the trunk. In several instances I have seen the palms of the hands affected. Implication of the mucous membranes has also been often mentioned, and especially those of the mouth. Behrend reported intense blennorrhœa from the disease being located on the vaginal surface, while Fuchs saw a case of erythema iris of the mouth and conjunctiva preceding for several days the appearance of lesions on the skin. The eruption is always symmetrical, without, however, presenting absolute symmetry. Often, one side of the body will be more severely affected than the other.

Clinical Manifestations.—The disease is generally multiform, either from the very beginning or from progressive evolution of its lesions. Appearing in successive crops and gradually extending, all stages of evolution and involution may coexist, fresh new lesions being found side by side with others which have already run their course. Primary efflorescences of various types may also be seen at the same time, and papules, blotches, vesicles, and bullæ be more or less mixed together. On the other hand, an attack may consist of one form of lesion alone.

The eruption may consist of bright or dusky-red blotches and papules surrounded by a zone of redness, which quickly fades out. The papules are elevated, obtuse, or convex, and vary in size from a pinhead to a pea or bean. They are discrete, or more or less aggregated together, and they may become confluent. The redness may be pressed out easily, but often a slight yellowish tinge remains. The lesions are generally of short duration and disappear without desquamation, but slight scaling may occur. Pigmentation almost always remains for a while, but ultimately fades away (*erythema papulatum*).

Instead of a short existence, the papule may persist and undergo various metamorphoses of shape and character, and thus present most manifold clinical pictures.

Enlargement of the closely aggregated papules may take place and result in their coalescence and the formation of raised, deep red patches of various size, or the primary lesions may remain discrete and become

as large as a nodule or tubercle (*erythema tuberculatum seu tuberosum*).

The papules may enlarge in a centrifugal manner to constitute livid red disks, and involution ensuing more or less rapidly in their central portions, a ring-shaped lesion remains, which is bounded by a slightly elevated red border, enclosing a pale, or livid, or purplish-red depressed center (*erythema circinatum seu annulatum*). A new papule may now develop in the center of the ring and go through the same metamorphoses as the primary one. Being, however, of more recent origin, it is of a brighter red, and in this way several shades of color may result. This constitutes *erythema iris*, and the lesion may consist of two to three, and even as many as five to six, concentric rings, according to the number of successive papules which have arisen in the center and undergone the same changes.

When several lesions of *erythema annulatum* come together in the course of their peripheral growth, the areas of contact disappear and a polycyclic outline results. Or, a portion of a ring may undergo early involution, while the remainder continues its progressive march, and, meeting with others, they form gyrate, or sinuous, or other shaped lesions (*erythema gyratum*). *Erythema marginatum* belongs, I believe, in the above form, but Crocker separates it from *erythema gyratum*, to which, however, he grants it to be allied. He describes it as represented by a flat disk, which enlarges peripherally and progressively subsides in the center. During its course it joins with adjacent lesions to form a sinuous broad margin, which is abruptly limited externally, but slopes gradually internally. It may traverse the entire circumference of a limb or cover large areas of surface in a few days, leaving fawn-colored pigmentation.

The primary papule may become more elevated and dense from increased exudation and correspond somewhat to the lesions of urticaria. They itch intensely, and the efflorescences, varying in size from a pea to a penny and capped in the center by a small blood crust due to scratching, consist of a slightly elevated red border surrounding a blue-red depressed area (*erythema urticatum* or *lichen urticatus*).

Not uncommonly, vesicles develop on the apex of a papule or on some of the erythematous blotches. They are usually very small, ephemeral in existence, and, their contents being absorbed or drying up, a minute, adherent, thin and clear crust is formed (*erythema vesiculosum*). They may occur in groups, but are more often discretely distributed between papular or other lesions, or erythematous blotches, or in conjunction with the bullous form of the disease. Exceptionally, the contents of the vesicles become purulent and form thick crusts. Hæmorrhages may also occur into their cavities.

Erythema Bullosum.—Upon the erythematous patches, bullæ may also arise as primary efflorescences, or they may be secondary and due to the confluence of several vesicular lesions. They may, however, also arise from apparently normal skin. The bullæ may be discrete, or more or less grouped, numerous or in small number, and in company with papules, blotches, and other lesions. Their contents are at first clear, but soon become turbid and occasionally purulent. Hæmorrhages into their cavities are not uncommon. Frequently they rupture early in their existence, and thin, yellowish crusts form, which repose upon a red, congested, slightly moist base. Ulceration does not occur, but when the crust has fallen a pigmented area remains, which gradually disappears. Cicatrices are not left.

The bullous form of exudative erythema constitutes one of the gravest of its manifestations, and it has generally been observed by myself covering a large extent of surface and more or less universal. In some cases the inflammatory reaction reaches a high grade; it extends to the subcutaneous cellular tissue, and secondary implication of the lymphatic vessels and glands may occur. Ulceration of the bases of the bullæ may likewise take place. The eruption is sometimes accompanied by severe itching and burning, and these cases Brocq is inclined to regard as examples of acute *dermatitis herpetiformis* of Duhring. The lesions often develop on the tongue, the lips, in the buccal cavity, and in the nose, appearing as erythematous patches, upon which bullous lesions arise. These rupture quickly and expose irregular, red areas covered with ragged and detached fragments of epithelium. Small ulcerations may be found in the nose.

Herpes Circinatus and Iris.—The primary red, elevated papules enlarge, and, sinking in the center, form rings of variable size. Upon the periphery a row of discrete or of confluent vesicles develop and bound the deep red or purplish center (*herpes circinatus*). Or, a vesicle arises upon the primary papule and dries up into a crust. The lesion then enlarges, the central area sinks in, and a circlet of vesicles develops upon the peripheral margin. Evolution of the lesion may continue and a red zone appear beyond the primary vesicular border, and upon it another ring of vesicles arises. In this way, several concentric rings may form, and the picture presented will be that of a central crust, or a recent central vesicle, surrounded by a deep or bluish-red area, which is bounded by one or more concentric circles of vesicles and an outward red zone. This constitutes *herpes iris*. Variations in its evolution are, however, recorded. Crocker states that the primary vesicle may enlarge and flatten out and be surrounded by a narrow red zone. The fluid may then be absorbed in the more central portions and a purplish

depression remains, or only a part of the exudation disappears, leaving a central vesicle surrounded by a purplish ring and most externally a vesicular circlet. I have never observed this mode of evolution of the lesion, but always the one first described.

The efflorescences are generally symmetrical and appear in crops. They may coalesce to occupy large areas, but more usually they are limited to the hands and wrists, or they are situated over the joints—the elbows and knees. In some rare cases the eruption has been more or less universal and severe hæmaturia has accompanied it. Hæmorrhages into the lesions may likewise occur.

The mucous membranes of the lips may be swollen and covered with vesicles or crusts; the tongue, the larynx, pharynx, etc., may also be affected. Conjunctivitis and ecchymoses of the orbital regions have been observed.

Of these forms of *erythema multiforme exudativum*, the *papular* one is possibly the most frequent, and *herpes iris* the rarest. At any rate, in my experience, the former constitutes the large majority of cases, and occurs either alone, or mixed with circinate, vesicular, or erythema iris lesions. The *bullous* form is much more uncommon and represents a severer type of the disease. Subjectively, there are in erythema multiforme only slight itching and burning. Occasionally, these may be severe in degree and, especially in *erythema urticatum*, most annoying.

The course of the affection presents in the large majority of cases no special symptoms. After a variable duration, the bright redness fades and becomes dark, livid, or purplish, and finally all color disappears, except some pigmentation, which ultimately is likewise removed. Occasionally in the bullous form, and when there has been hæmorrhage, purulent infection may occur and subsequent ulceration and scarring. In children, this result is not uncommon. Usually there is no desquamation, but a slight scaling may be observed. During the course of an erythema multiforme visceral complications have been noted, and also consecutive diseases. In certain cases the lungs, pleura, kidneys, brain, etc., have become pathologically affected, and Gerhard collected twenty-two cases of endocarditis occurring during the course, or after an attack of erythema multiforme. These and other processes, which may arise, are not, however, integral parts of the disease *erythema*, but simply, in such cases, the product of the same agent or factors which provoked on the skin also the erythematous eruption. In the same manner, secondary pathological conditions may originate on the skin, and furuncles, abscesses, gangrene, etc., may develop.

As a rule, the duration of an attack of multiform erythema is short, generally from one to six weeks. A series of relapses may, however, greatly lengthen this period; and Bazin, Kaposi, and others have recorded

cases which had lasted months and years. Hutchinson, Polotebnoff, and Lewin report cases varying in duration from six months to five years.

The process is peculiarly liable to relapse. The recurrences may occur in rapid succession, or several times a year, or they may follow an annual type, appearing at about the same time for several years in succession. There is no limit to the number of such relapses, and in a patient of my own I have seen eighteen recurrences of an erythema papulatum and circinatum in the space of three years.

Etiology.—No age is exempt, though the disease occurs more frequently in young adults and in the female sex. It appears at any season, but especially during the spring and fall, and a *typus annuus* may often be observed. Climatic changes seem to influence strongly its development, and the disease develops very commonly on immigrants a short time after their arrival in this country. Alternations of temperature, chills, exposure to cold, wind, and the sun, have been mentioned as exciting causes, as well as bad and insufficient food and change of diet. Mental and physical excesses and a general run-down condition have been factors I have observed, and anæmia, chlorosis, etc., are others often mentioned. The eruption develops after the ingestion of many drugs—such as digitalis, quinine, chloral, copaiba, mercury, bromide and iodide of potassium, etc. In regard to the iodide of potassium, I have never seen it produce erythema multiforme unless the patient had some organic cardiac lesion. I do not, however, make the statement as evidence of an absolute fact, but only of personal experience. The erythema likewise develops after urethral irritation by instruments, and also when uterine disturbances exist. In the course of a gonorrhœa, and of general systemic and infectious diseases, it frequently originates. Of these, we may mention typhoid and typhus fevers, infectious endocarditis, variola, cholera, the grippe, puerperium, septicæmia, uræmia, diphtheria, syphilis, etc., as well as acute articular rheumatism, gout, etc. Lewin, Molènes-Mahon, Vidal and Leloir, and others express a belief in the possibility of the process being due to a primary infection; but facts which would substantiate such an opinion are as yet not satisfactorily established.

Pathology.—Many distinguished writers regard *erythema multiforme* as an essential and specific disease. It is, however, difficult to reconcile that view with the manifestly manifold etiological origin of the process and the numberless conditions under which it arises. Such an opinion may be entertained, if only those cases occurring in an apparently idiopathic manner are considered; but in the vast majority, it certainly appears preferable to regard the disease as a symptomatic reaction on the part of the skin to some one of many varying toxic or other influences, derived from without the body or elaborated within it. To attribute

essentiality and specific nature to a disease, would necessitate a belief that it has always had one and the same cause; but erythema multiforme has innumerable and most diverse inducing factors, is at times due to a local toxic influence, again is an angioneurosis and of central origin, etc.; so that it can be regarded as nothing less than a specific disease.

There are a number of recorded investigations, which also suggest strongly that the affection is at times an infectious disease. Cordua and Luzzato found micrococci in the blood of erythema multiforme patients; Manssurow mentions bacilli and spores; Legrain and Simon obtained two forms of cocci; Haushalter, a streptococcus. Leloir also demonstrated diplococci and streptococci in the blood; and more recently (1893) Finger found in the lesions of an erythema papulatum, which developed in a case of typhus fever, the streptococcus pyogenes filling up the capillaries, and in another case of typhus a small round coccus similarly situated. He concludes from this that in many cases of symptomatic erythema the process is a metastatic bacterial dermatitis, which is produced by the transportation of the micro-organisms to the skin through the blood current. He would attribute a similar mode of origin to all cases of the disease occurring in the course of suppurative processes—gonorrhœa, syphilis, etc. On the other hand, Finger found no bacteria in two cases which were apparently idiopathic in origin.

In regard to the pathological mode of origin of erythema multiforme considerable latitude of opinion exists. Lewin, Schwimmer, and Auspitz considered the eruption to be an angioneurosis due to vasomotor disturbances, and for some cases that would certainly be true. But this disturbance may be from the local effects of an exciting factor, or, again, from central action, as claimed by Claisse and Legendre, who express their belief that it is a toxic angioneurosis from the absorption of toxines. According to Finger, in many cases the erythema is a metastatic bacterial dermatitis and neither angioneurotic nor toxic, but due to the local effects of the bacteria. In regard to the erythema originating from drugs, the vasomotor theory is the one generally accepted. As may be seen from the pathological features mentioned, the mode of origin of the disease differs greatly in individual cases, and to such an extent is this true that it is impossible to give an explanation for its production which will satisfactorily pertain to each and all of its examples.

The morbid anatomy of the erythematous macules and patches consists in a dilatation of the papillary and subpapillary blood-vessels and an exudation of serum into the cutis. There is also a slight infiltration of white and red blood-cells about the vessels. In the papular form these symptoms are greatly increased, the lymph spaces are dilated, and the infiltration extends throughout the derma. Vesicles and bullæ are formed by the penetration of the exudation through the intercellular spaces of the

rete, and the lifting up of the stratum corneum and portions of the stratum lucidum and granulosum to constitute the outer wall.

Diagnosis.—The peculiar localization of the eruption in the large majority of the cases, its multiform aspect, its acute course, the absence of scaling, and the slight degree of subjective disturbance, sufficiently characterize *erythema multiforme* to guard against an error in diagnosis being made.

The circinate forms may be differentiated from tinea circinata and psoriasis by their symmetrical arrangement, and by the slight or the entire absence of desquamation. Papular eczema may, however, be symmetrical and occupy the same locations: but the papules are more acuminate, do not tend to enlarge peripherally, often become vesicular, and merge together to form patches, which are crusting or moist, while the subjective sensations are severe. Urticaria has no definite localization, but appears on all parts of the body. The wheals originate quickly, are of a lighter red, often white, and are of short duration. The itching is likewise severe.

Prognosis.—The disease is almost always benign and tends to get well spontaneously in a few weeks. Only pigmentation remains for a while, and exceptionally there is scarring. There may, however, be grave results, and even death may follow the disease. Lewin collected ten fatal cases. Uffelmann, Vidal, Leloir, Molènes-Mahon, and others have all recorded instances terminating in death from some visceral complication. When the bullous form occurs, the possibility should be borne in mind of septicæmia developing from secondary infection favored by the denudation of the cutis, due to rupture of the lesions. When the erythema develops secondarily and as a complication of some severe disease or other, it is at times of bad presage; but, on the whole, the prognosis in these cases will have to be based upon the nature of the primary disease, and independently of the erythema.

Treatment.—The internal treatment in the vast majority of cases is limited to rectifying all existing defects of functional or somatic health. A purely symptomatic medication is thus indicated, though, when there is a rheumatic or a gouty constitution, or a tubercular predisposition, then the alkaline salts, cod-liver oil, tonics, good and suitable food are especially called for. Villemin recommends iodide of potassium as a specific when given in doses of thirty grains a day, and I have found it at times very serviceable, but especially in the bullous and vesicular forms, and when the behavior of the process was suggestive of an infectious disease. Care must, however, be observed in its administration, as the eruption may, on the other hand, be much aggravated by its use. In the markedly exudative forms—*erythema bullosum*, *vesiculosum*, *herpes circinatus* and *iris*—arsenic in full doses is often of the greatest benefit.

Either the liq. sodæ arseniatis or Fowler's solution may be given in doses of from gtt. iij to x, or more, every two to three hours, and well diluted. Locally, any dry powder may be applied, as starch, lycopodium, etc., or a lotion of liq. plumb. subacetat. 3 j, ad. 3 j, or one containing zinc oxide and carbonate of magnesia, āā gr. xv to the ounce of water. A two-per-cent salicylic acid ointment may also be used, or, if there is much itching, from ten to thirty grains of menthol can be added to it. Ichthyol in ointment form, gr. x to xxx, ad 3 j, I have likewise found very good, especially when much excoriation of the surface was present. In the bullous form, ichthyol, four to six per cent in caron oil, can be recommended. Carbolic acid, bichloride of mercury (1 to 5,000), and other antiseptic lotions, may also be used if preferred.

ERYTHEMA NODOSUM.

Synonyms: Erythème Noueux; Dermatitis Contusiformis.

Symptomatology.—*Erythema nodosum* is frequently, though not invariably, preceded by chills, elevation of the temperature, general *malaise*, furred tongue, and possibly gastric symptoms. Headache, myalgia, articular and rheumatic pains are generally present, the lower extremities being usually and especially affected. When the eruption appears, it is almost always localized on the anterior aspects of the tibiæ, the lesions being arranged in a more or less symmetrical manner. Outbreaks may, however, occur on the arms, the trunk, the face, and it has been seen even in the mouth (Pospelow). The lesions are multiple, appear in crops, sometimes at intervals of a few days, and they are represented by roundish or oval nodosities, varying in size from a nut to an egg, and diffusely situated in the tissues, which in their immediate vicinity may be somewhat œdematous. At first of a light or a bright red, they are very painful to the touch, and for twenty-four or thirty-six hours after their appearance they are accompanied by a dull aching and a sensation of burning. The individual lesions last for eight to ten days, gradually becoming softer, of a dusky or a violaceous red; and finally going through shades of black and blue, yellow and green, they disappear altogether, leaving a slight pigmentation. Ulceration or suppuration never occurs. The entire duration of the process is generally from three to five weeks, though it may be prolonged by successive relapses. These latter are very liable to take place, and may appear every spring and autumn, or show a tendency to follow an annual type. *Erythema nodosum* frequently coexists with *erythema papulatum* or *tuberosum*, or with some other forms of erythema multiforme; and though its course is usually benign, some malignant cases have been recorded by Demme, in which hæmorrhage and gangrene took place; by Schmitz and Lewin and others, in which visceral complications and fatal results occurred.

PLATE I.



Colonytype Co.

ERYTHEMA NODOSUM (Chatelain).

Etiology.—*Erythema nodosum* appears more frequently in young people than in the elderly, and it affects the female sex oftener than the male. It develops especially in poorly nourished and debilitated subjects, and is seen as an accompaniment of chlorosis and general nutritive disturbances. It has been observed in connection with menstrual irregularities, and in such cases it oftentimes precedes the menses by a few days. Bromide and iodide of potassium and other drugs have also been known to produce it. Uffelmann and Oehme claimed that it was very common in consumptives and in the offspring of tubercular parents, and they considered it then to be a grave symptom, on account of the systemic disease; but corroboration of their views is wanting. *Erythema nodosum* has been frequently recorded as a complication of rheumatism—especially of its acute articular form—of malarial fever, and of various systemic diseases, as pneumonia, endocarditis, etc., and also of syphilis. Vidal and Leloir have recently expressed their opinion, however, that these cases are not examples of *erythema nodosum*, but of *erythema multiforme tuberosum* and of urticaria, and that they are symptomatic eruptions, due to the same causes which produced the systemic disease. There are also many cases which arise idiopathically—that is, without any apparent or traceable cause.

Pathology.—Many authors would make of *erythema nodosum* an independent and specific disease; while the Vienna (Kaposi, fourth edition) and the English schools would regard it as essentially a part of or identical with *erythema multiforme*, though granting that as a clinical type it presents certain distinctive features. Vidal and Leloir consider it to be an independent idiopathic disease; but owing to the close resemblance which *erythema nodosum* bears to *erythema multiforme* in its localization, course, and etiology, I would rather agree with those who regard the processes as being intimately related to each other. I would, therefore, look upon *erythema nodosum* in the same manner pathologically as I have mentioned for *erythema multiforme*—that is, that it is a symptomatic eruption and not a specific disease. Many cases may originate apparently without cause—may seem to be idiopathic; but that only means that their causes have escaped our observation, or are beyond our present ability to recognize. It does not mean that they have no definite cause, nor does it suggest that the etiological factor is a specific one.

Morbid Anatomy.—A lesion of *erythema nodosum* consists of serous exudation throughout the entire cutis, and even the subcutaneous tissue. Blood stains and distention of the lymph spaces occur, and an infiltration of red and white blood-corpuscles. Hæmorrhages take place in the cutis itself, as well as in the subcutaneous connective tissue.

Diagnosis.—The localization of the lesions, especially on the anterior aspects of the lower extremities, their painfulness to touch, their

symmetrical arrangement, and the gradations of color through which they pass during their involution, render the diagnosis a matter of ease. It is only when they develop on some unusual localization that the recognition of the process may be difficult.

The *erythème induré des scrofuleux* may be distinguished from *erythema nodosum* by the painlessness of the former, its want of symmetry, its long duration, and the absence of resemblance to ecchymoses.

Nonulcerating gummatous lesions on the lower extremities are characterized by being sharply defined and indolent in their course, instead of being diffusely limited, as are those of *erythema nodosum*.

Prognosis.—The prognosis is generally good. The process tends to disappear after a variable duration of three to six weeks. Relapses may, however, occur. Patients may remain in a poor state of health for some time and severe anæmia develop, convalescence being protracted. Death may be the result of some secondary complication arising in the course of an attack.

Treatment.—The internal therapeutic measures demanded for *erythema nodosum* are indicated by the symptoms existing in any given case. The bowels should be regulated, a light diet ordered, and, according to the constitutional disturbances present, either quinine, or iron, or alkaline mixtures, or salicylate of soda, etc., should be prescribed. There are no special remedies called for.

Locally, the legs should be elevated and rest be enjoined. Warm lead solutions are useful to apply to the lesions, but I have obtained the best and most grateful results from an ichthyol ointment (three to five per cent).

Erythema Induratum, or the *erythème induré des scrofuleux* described by Bazin, and, according to him, confounded with *erythema nodosum*, is occasionally, though not frequently met with. It occurs in patients of lax fiber, of strumous constitution, and appears to stand in close relation to excessive fatigue, overwork and prolonged standing. Those suffering from cold hands and feet seem to be predisposed to it, and it develops more often in winter than in summer. Young girls and women are especially affected, but not exclusively, Crocker mentioning its occurrence in boys and in elderly women. Bazin described it as being constituted by a single ill-defined patch situated over the external or the anterior aspects of the legs; but Crocker mentions the calf of the leg particularly, and also states that there may be several patches. The morbid symptoms consist in a uniform induration limited to the skin (Bazin), bright red at first, but soon becoming sanious in color, or of superficial or deep nodules, which coalesce to form brawny infiltrations, red and later livid, or presenting no change in color (Crocker). The

outbreak of the lesions is unaccompanied by any constitutional symptoms; their course and duration are long, and relapses occur. Pain and tenderness are usually absent, though at times marked (Crocker). The induration undergoes slow absorption, but at times necrosis and sloughing take place, and an indolent ulcer is formed.

Erythema nodosum may be differentiated from *erythème induré* by its more acute and shorter course, the febrile reaction, and the multiplicity of lesions, which are usually distributed in a more or less symmetrical manner. A gummatous syphilide may be distinguished by its mode of evolution, its much shorter duration before ulceration takes place—a result which is, moreover, the rule—and also by its tendency to progress over the surface in a serpiginous manner, leaving scarring. When *erythema induratum* occurs in the form of a number of nodules, it may be very difficult to differentiate it from that form of gummatous syphilide which is also met with on the legs, and which usually undergoes resolution without ulceration. This resolving gummatous syphilide likewise occurs in the form of nodular groups in the skin; it runs a slow course, the external surface is generally unchanged as to color, and it is usually only slightly painful. Its results, however, are slight or marked atrophy of the seat of the infiltration; but yet the symptoms may not be so apparent that recourse to syphilitic treatment may not be advisable in some cases to determine with certainty the nature of the morbid process.

The treatment indicated for *erythema induratum* is prolonged rest, elevation of the legs, change of occupation, or compression over the patches. At the same time, tonic treatment, general hygienic measures, good nourishment, etc., are indicated. Recovery is generally slow, and the course of the disease a protracted one.

PELIOSIS RHEUMATICA. (GEORGE T. ELLIOT.)

Synonym: Purpura Rheumatica.

Definition.—A form of disease usually acute and accompanied by inflammatory and painful joint affections, and characterized by an eruption of hæmorrhagic papular lesions and patches, distributed especially over the extremities.

Symptomatology.—The disease was first described by Schönlein. A period of invasion precedes the eruption for a variable length of time, and is shown by general *malaise*, systemic disturbance, and painful swelling of the joints, especially of the knees, wrists, and ankles. The temperature may be normal, but more often it rises to 100°, or more. In a few days the eruption appears and the pain then subsides. The lesions occupy practically the same regions as have been mentioned for erythema

multiforme, but sometimes they are located particularly about and around the inflamed joints. They consist of bluish-red patches and slightly elevated bright red papules, which quickly become purplish; but they may, however, be purpuric from the first. Their color can not be effaced by pressure. After persisting for a few days, they pass through the various gradations of color seen in a contusion and disappear altogether. The disease may be limited to one outbreak, or the eruption may come out in successive crops and run a course of four to six weeks; or it may disappear altogether, and ten days or more later a relapse occur, the joint and other symptoms becoming again manifested. In some cases a succession of relapses may ensue for years, and, according to Kaposi, the eruption is then always associated with chronic nephritis or an organic heart lesion. It most usually appears alone, but it may coexist with or complicate all other lesions of erythema multiforme, such as *erythema circinatum*, *iris*, *herpes iris*, *erythema bullosum*, *nodosum*, etc.

The mucous membranes of the mouth and throat are often attacked, and areas and points of hæmorrhage may be observed. Kaposi mentions hæmorrhages from the gums, leading to severe and fatal results; but the occurrence of this symptom would suggest rather purpura hæmorrhagica, which sometimes develops as a complication. Paroxysmal hæmaturia, acute endocarditis, and transitory or valvular lesions have also occurred during the disease. Two cases are recorded (Kaposi) of gradual development of aortic insufficiency.

Etiology.—Women are said to be affected more frequently than are men, and the disease occurs oftener between the ages of twenty and thirty. Still, all ages are subject to it. Among etiological causes mentioned are rheumatic fever, rheumatic subjects, and previous attacks. The seasons of the year also appear to predispose to it. Crocker mentions chills as exciting causes. I would state that I have frequently seen the process originate during the existence of malaria, and also develop after patients had been working for a short time in damp cellars and other places. It also arises in the course of general infectious diseases.

Pathology.—It is impossible to entertain the theory of a vasomotor neurosis for *peliosis rheumatica*, in the face of the general systemic disturbances which usher in the cutaneous symptoms, and which accompany the process during its course, and also in view of the fact that the lesions are not the product of simple hæmorrhage, but are accompanied by inflammatory changes in the cutis. In consequence of these features and the etiological conditions under which the disease arises, it would certainly appear to me more rational to regard it in the same manner as I have specified for erythema multiforme in general: not as a specific eruption, but as a symptomatic evidence of the pathological influence of various causes upon the systemic organism. These may be most different

in nature, at one time of one kind, at another of another sort, and possibly in many cases an infection with micro-organisms may be the active inducing cause producing the general and the local disturbances. I would only mention in this connection the discovery by Finger of small round cocci in a case of erythema hæmorrhagicum; and in another purpuric disease—*purpura hæmorrhagica*—Letzerisch and Giovanini and others have shown micro-organisms to be the causal factors. It is, therefore, perfectly possible that many cases of *peliosis rheumatica* are due to micro-organisms.

Diagnosis.—The recognition of hæmorrhage into the skin is easy, when it is borne in mind that pressure does not cause the redness to fade. Such lesions occupying the localities mentioned and associated with the systemic disturbances already described, with the joint swellings, the pains, etc., are sufficient to constitute the diagnosis of *peliosis rheumatica*.

Prognosis.—The prognosis will depend upon the presence or absence of complications. If the latter is the case, there is no danger to the patient, and only relapses and recurrences of the outbreaks may be expected. When complications exist, the prognosis will vary according to their nature.

Treatment.—The general functional health should receive proper attention, and rest in bed be enjoined. The salicylates and salicylic acid are recommended when there is much pain, and ergot and turpentine have been given to control the hæmorrhages. I have found the mineral acids, especially dilute sulphuric acid, particularly good when given in full doses. Tonics are also indicated, and a nourishing diet should be ordered. Over the lesions, cold applications may be made, or cloths wrung out in vinegar and water be applied. Ichthyol in ointment, or in watery solutions (two to three per cent), is also of service.

ERYSIPELAS. (GEORGE-T. ELLIOT.)

Synonyms: Ignis Sacer; St. Anthony's Fire; Rose.

Definition.—Erysipelas is an infectious and contagious disease of the skin, with which there is participation of the general system, shown by the presence of fever and other evidences of systemic disturbance. It has for its cause special micro-organisms—the streptococci of Fehleisen.

Symptomatology.—It is unnecessary to adhere to the divisions formerly made of *idiopathic* and *traumatic* erysipelas, as the cause of the disease, in whatever way it arises, is generally conceded to-day to be the streptococcus of Fehleisen.

Erysipelas phlegmonodes will likewise not be treated of, as it is not a

true, but a pseudo-erysipelas, due to infection with staphylococci and the streptococcus pyogenes, and not caused by Fehleisen's coccus.

An attack of erysipelas is usually ushered in by a sensation of chilliness, slight rigors, or even decided chills; but these may be absent, or so slight and transitory as to occur unnoticed. Elevation of the temperature follows immediately, and complaint is also made of more or less general *malaise* or prostration. In a few hours, or perhaps longer—it may be in twenty-four hours—the erysipelatous inflammation makes its appearance.

Local Symptoms.—The process manifests itself primarily at the point of infection. At first only a limited area is attacked, and the disease is represented by an œdematous, swollen, elevated patch, sharply defined though irregular in outline. The affected area is tense and indurated, sensitive and even painful to the touch, and sometimes itchy. In color, it is bright red and shiny, though at times violaceous or livid. When the redness is pressed out with the finger, a yellow color remains, but the redness returns with great rapidity when the pressure is removed. The amount of swelling depends very much upon the locality affected, being most marked where there is a great deal of loose cellular tissue, as on the eyelids, lips, penis, etc., but it is only moderate in those regions—as the scalp—where the skin is more or less intimately connected with the underlying tissues. The eyelids are frequently so enormously swollen that they can scarcely or not at all be opened; the lips are protuberant and resemble sausages. On the other hand, patches or areas of erysipelas on the scalp will be found only slightly elevated above the level of the surrounding skin.

According to the intensity of the inflammatory reaction in the cutis, the affected area may be only tense, shiny, red, and indurated; or, owing to the excessive exudation into the epidermis, vesicles or bullæ form over the surface, and these, becoming pustular in character, dry up into more or less thick crusts. Gangrene even may supervene from the compression of the blood-vessels, but this more usually occurs on the penis, scrotum, or eyelids. Owing to secondary infection, purulent destruction of the tissues may result, or abscesses and furuncles form. The primary symptoms on the skin may follow several courses. The erysipelas may develop over a certain area, undergo no extension, but, remaining stationary for a few days, gradually disappear; or it may begin on a very small spot, enlarge rapidly until it has attained the size of a silver dollar, and then undergo involution. Again, its extension may be rapid, so that it may quickly cover an entire cheek, and apparently tend to stretch out and to implicate the lips or the nose, the forehead or the neck. More commonly, the disease has a tendency to creep over the surface, extending itself in several directions at the same time, and to progressively undergo retrogression and involution as it advances and implicates new territory.

The progression of the disease is always along the red, swollen, tumefied border, while the retrogression occurs on the side which has already become flattened. This form—*erysipelas ambulans*—may by its progressive course run over very large areas of surface, covering the entire body, and then, beginning again at its starting point, repeat its course a second time.

Erysipelas, especially on the face or scalp, is often erratic in its march, jumping from one place to another, the various areas attacked being separated from each other by portions of skin apparently perfectly normal. In cases noted by me, the process might be primarily located on the nose and then suddenly appear as an isolated patch on the cheek, or jump to the ear or forehead, or from the latter to the scalp. These isolated patches would undergo little or no extension, but would only become more indurated and pronounced *in situ*, remain stationary, and then gradually subside, the extensions of the attack being, by the development of new isolated patches, distant from the original and secondarily affected areas.

When subsidence and involution of an attack of erysipelas begin, the tumefaction and swelling diminish, the induration and the tense appearance of the surface grow much less, the patch has a boggy, doughy feel, the bright acute redness gradually gives way to a bluish or brownish red, and desquamation of the epidermis begins. Little by little the exudation and infiltration in the tissues are absorbed, and a gradual return of the skin to its normal condition and appearance ensues. The surface which has been affected may, however, remain sensitive and irritable for some length of time. Not infrequently, the disease lights up again, even though complete involution had apparently occurred, or, owing to secondary infection, furuncles, small abscesses, etc., may develop.

When the scalp is the seat of an erysipelas, the affected areas may be entirely concealed by the hair, but they may be recognized by their tenderness and sensitiveness, as well as by the increased resistance to the touch and their boggy or swollen character. Alopecia very often occurs. It may be severe, and the loss of the hair rapid and excessive, or only gradual and slight. Regeneration of the hair usually takes place after the attack has subsided. Repeated recurrent attacks of erysipelas on the same surface results frequently in a permanently thickened condition of the skin. This pachydermia develops most usually on the face or the legs, but also on the ears and lips. It may be slight or very severe. On the legs, it may lead to the production of a condition of elephantiasis, especially if there are circulatory disturbances, as from varicose veins, etc.

General Systemic Symptoms.—The constitutional symptoms ushering in and accompanying an attack of erysipelas present many variations of degree and character. The initiatory fever following the rigors or chills

may be moderate— 100° to 102° Fahr.—the temperature going higher only later and in proportion to the extent of surface implicated, or to the development of any secondary complication; or, from the very beginning it may be of a high grade— 103° to 106° Fahr. These high initial temperatures will be met with most usually in individuals broken down and weakened in health, in alcoholics and hard drinkers, in those affected with some one or other severe systemic disease or injury, upon which the erysipelas is ingrafted as a complication. In elderly people, I have usually found the temperature of a low grade. Cases have also been recorded in which there was no fever at all, but it is doubtful that such were examples of the disease in question.

During the course of an erysipelas, the fever may continue to be moderate, with evening exacerbations and morning remissions; or, if a large extent of surface is implicated, or the march of the disease is rapid, it may be nearly continuous until a halt in its progress takes place, when it will gradually subside. I have invariably found the temperature in uncomplicated cases a reliable indicator of new extension of the disease, and particularly have been led by its sudden elevation in cases of erysipelas erraticum to seek for new areas of implication, and to sometimes find such, which from their distance from the primary seat of the process, or from other causes, might have been overlooked. If complications of one kind or another arise, the temperature may of course be influenced by the nature of the complicating disease. The pulse in erysipelas presents no especial or particular characteristics. It is essentially a febrile pulse, and will consequently vary in volume and rapidity in accordance with the temperature. When the scalp is affected and grave cerebral symptoms are present, the pulse may become slow and full. Preceding the appearance of the erysipelas, there may also be general *malaise*, or gastric disturbance may develop—vomiting, complete anorexia, etc.—that is, symptoms such as commonly accompany an outbreak of one of the exanthemata. The tongue is usually dry and coated, and later on may become fissured, sometimes denuded of epithelium and raw-looking. The breath is offensive. During the course of an attack, epistaxis may occur and at times prove very troublesome. The urine in erysipelas is usually high-colored, but presents no particular changes, except a diminution in the chlorides. In severe cases, however, it may be scanty, and contain some albumin.

Throughout its course, erysipelas will present symptoms varying according to the systemic condition of the individual, the locality affected by the disease, and the absence or existence of complicating processes. In the elderly, great prostration, sopor, delirium, etc., may develop rapidly, the attack being an aggravated one, and œdema of the lungs or brain supervene. Similar symptoms may occur in alcoholics and in subjects of

diabetes and Bright's disease. If the scalp is affected, severe cerebral symptoms may arise; or, if the pharynx is implicated, suffocation may be threatened, owing to the possibility of œdema of the glottis supervening; or, in a puerperal woman, an erysipelas of the vulva may lead to a peritonitis, etc. The course of the process may, however, be of a very slight grade, and the symptoms accompanying it only such as may be met with in any febrile attack.

There is no portion of the body which is immune to erysipelas. It may develop wherever inoculation of the specific micrococci occurs. According to statistics published in works on dermatology, it originates, however, more frequently on the face than elsewhere. When it develops on the face, the nose is often its starting point. The nasal, or buccal, or pharyngeal mucous membranes are often the portions primarily affected, and the disease extends from one or the other of these to the skin. When the mucous surfaces are attacked, they are swollen, dry, red, and shiny. If the mouth is its seat, the tongue is dry and fissured, the lips swollen, and there may be an abundant drooling of saliva. If the erysipelas is in the pharynx, the patient complains exceedingly of pain in swallowing, in speaking, and in making any movements with the throat. The process will also often develop at the umbilicus in the newborn, in puerperal women on the genital organs, at the site of a vaccination lesion, etc.

Pathology.—Pathologically, erysipelas is essentially an inflammation of the skin, produced by the streptococci of erysipelas. These were first discovered and described by Fehleisen. He, as well as others, has demonstrated their specific action by the repeated successful inoculations made on man with pure cultures of the micro-organism. That erysipelas is infectious and contagious has been so often observed, that scarcely more than mention of the fact is necessary. It may be communicated by direct contact, or through the medium of some person, instrument, clothing, etc. We may practically state that for the production of erysipelas two factors alone are necessary—the streptococci, and a point of entrance into the tissues. This latter may be constituted by any lesion of the cutaneous surface, or of the mucous membrane of the nose, mouth, or pharynx, etc. The lesion may be a slight scratch, an abrasion, or wound of some kind, a surface simply denuded of epidermis or epithelium, or some ulceration, loss of tissue, surgical wound, etc. The micro-organisms, obtaining an entrance at some point or other, multiply in number, penetrate into the tissues, and elaborate those products which, absorbed into the general system, produce the symptoms, both local and general, seen in erysipelas.

Morbid Anatomy.—The changes, which occur in the tissues themselves in erysipelas, are represented by a serofibrinous exudation and an infiltration of small round cells. The latter is less marked in the papillary layer than throughout the rest of the derma, and extends into the sub-

cutaneous fatty layer, but the cells are massed particularly around the blood-vessels and lymphatics. The constant implication of the hypoderm is in great part the cause of the induration felt. Owing to the exudation, the connective-tissue fibers of the corium are swollen and the lymph spaces dilated. When vesicles or bullæ are formed, they originate at the level of the stratum granulosum, and this layer, together with the horny epidermis, constitute the external wall. The cells of the rete undergo granular or colliquative degeneration and destruction, and the resulting cavity is filled with a serofibrinous fluid and a few leucocytes, or with pus. The exudation also penetrates into the hair-follicles, separating the sheaths of the hair from the root, and thus leads to the subsequent alopecia.

If sections are stained with methyl violet, the streptococci can be readily seen in the lymphatics of the corium especially, and also in those of the fatty layer. When the multiplication of the cocci is excessive, they may also be found in the lymph spaces, but they never penetrate into the blood-vessels (Fehleisen). The streptococci are arranged in twos or form chains, more or less sinuous in shape, and collect in groups and masses in the lymph channels and spaces. In those cases in which pachydermia develops, a certain amount of the exudation and of the cellular infiltration remain after resolution has taken place. The wandering cells become fixed cells, united to each other by fibrils, and thus new connective tissue is formed, and, being constantly added to, results in the sometimes elephantiasic changes.

Etiology.—The cause of erysipelas being the entrance into the tissues of the streptococci of Fehleisen, all lesions of the surface may be said to expose the individual to the disease. It is for this reason that, after surgical and other wounds, parturition, vaccination, etc., the process develops so readily. Unquestionably, certain conditions of the tissues at the point of inoculation are necessary for the development of the micrococci, but what they may be are unknown. Possibly, the changes due to the presence alone of the lesion which gave them entrance are all that are necessary—possibly others. It can be certainly said that one attack predisposes to others, the tissues appearing to be more vulnerable and succumbing more easily. In my opinion, these new attacks are always due to fresh infection from without; but Besnier would believe that individuals subject to frequent relapses preserve from anterior attacks latent foci, which at certain times and under certain influences again become active. However that may be, the impression, which I have frequently heard expressed by physicians, that after one or several attacks of erysipelas the patient becomes immune, is unquestionably unwarranted. In my personal experience, I can mention a patient who, in the last twenty-three years, has had eighteen attacks of erysipelas of the face and other portions of the body; and Sabouraud, besides, has lately shown that the constantly re-

curring outbreaks of fever, etc., so regularly noted in many cases of elephantiasis arabum of the lower extremities, are always due to infection with the erysipelas coccus.

Individuals suffering from some chronic cutaneous disease appear to be also predisposed to erysipelas, probably owing to the many points of ingress afforded to the micro-organisms. We thus see the process frequently develop in subjects of eczema, lupus, etc.; or it may originate from abrasions or other loss of tissue, due to catarrhal processes of the nose or throat, and many cases have been seen by myself which began after an acute coryza, starting in the nares and then extending to the skin. As far as the general system is concerned, it may be stated that individuals run down and in broken health are predisposed to erysipelas. Those suffering from diabetes or Bright's disease are especially so, in my experience, as well as alcoholic subjects and the elderly. The origin of erysipelas from cold has been long a generally accepted fact; but to-day, when the definite agent producing the disease is thoroughly known, that factor can only be regarded as a predisposing and not as an active inducing cause.

Diagnosis.—The diagnosis of erysipelas should not offer any difficulty, if proper attention is paid to the clinical symptoms and the course of an attack. There is perhaps more danger of mistaking other processes for erysipelas than of failing to recognize a true outbreak of the disease itself. An acute attack of eczema of the face may resemble erysipelas, owing to the amount of swelling, the severe œdema of the eyelids, and the bright redness. But in eczema, the constitutional symptoms are usually absent, except in infants and young children, in whom elevation of the temperature accompanies almost any disturbance; the area of implication is not sharply defined; there is no progressive extension and synchronous involution, and the surface will be seen thickly studded over with minute vesicular elevations, which are sometimes more perceptible to the touch than the sight, or which may require oblique light to be recognized.

There is a form of disease, which occurs not infrequently on the face, which is constantly mistaken for erysipelas. It is also a process due to infection, and usually starts from the nose, sometimes from the angle of the mouth. It appears as a red inflamed surface of variable extent, either unilateral or bilateral. This dermatitis I have always met with in persons with some chronic catarrhal condition of the nose, or a folliculitis of the vibrissæ, or with an affection of the antrum, or with some pus cavity. In contradistinction to erysipelas, however, we find the swelling and œdema very slight, induration only slightly perceptible, no tendency to extension beyond limits first attacked, the borders gradually fading out, not sharply defined, and no systemic reaction.

Other diseases, which are often mistaken for erysipelas, are erythema and phlegmon. The characteristics of these are, however, so distinctive that it is scarcely necessary to particularize them.

Duration and Prognosis.—The duration of an attack of erysipelas is variable. In an uncomplicated case, the symptoms usually begin to subside in from five to eight days, occasionally in less time, or they may not undergo involution until ten days have passed. Again, the process may last several weeks, or longer, if the case is a progressive one and covers a great extent of territory, or, if continual reinfection takes place. If complications arise, the duration of the disease may, of course, be materially influenced. The prognosis, on the whole, is favorable, the majority of the cases terminating in cure. If the erysipelas is complicated by some severe systemic disease, the result is often, though not always, a fatal one. Still, in regard to such cases, as well as when the disease occurs in a puerperal woman, or in the elderly, a guarded prognosis should be made. Erysipelas of the umbilicus in the newborn is commonly fatal, and a very serious result may be expected when the patient has cardiac troubles or disease of the blood-vessels. If the erysipelas has developed as a complication of very grave injuries, wounds, etc., naturally the prognosis will be thereby influenced unfavorably. In those cases in which the disease has run a long and protracted course, the great debility resulting from the loss to the general system, through the abundant exudation, from the continual fever, etc., will not only in itself influence the prognosis, but also, in so far as the longer the disease lasts, the greater the opportunity for the development of grave and even fatal complications.

Treatment.—The treatment of erysipelas is both constitutional and local. In my own opinion, it is the latter which is the most important. There is, however, no question but that many cases will get well without any other treatment than the administration of the tinct. ferri muriat., the remedy which has for so long a period of time enjoyed a most extended reputation; and, besides, the disease is regarded by many as a self-limiting one, which gets well of itself, no matter what is done. The iron may be given in various doses, from $\mathfrak{M}\text{x}$ ad $\mathfrak{M}\text{xxx}$, *ter in die*, or every three hours. Quinine, phenacetine, or antipyrine may be administered to reduce the temperature, and the procedures usually observed for any febrile disease should be followed. If the attack is a protracted one, or associated with great debility, every means should be employed to keep up the patient's strength. Nourishing food, stimulants, tonics, etc., should be made use of to their fullest extent. Complications should receive special and appropriate treatment according to their nature, and it should differ in no wise from that in usage when erysipelas is not present. The functional health should also receive proper attention, constipation

be relieved, the urinary secretion watched, diuretics given if necessary, etc. In other words, the general systemic treatment is purely a symptomatic one, and will vary according to the type of the attack, the character of the symptoms, the nature of the existing complications, and the age and general condition of the patient. There is no remedy which, administered internally, exercises a specific action on erysipelas.

Local Treatment.—The first indication to be followed in regard to the local treatment is the thorough cleansing and disinfection of the focus from which the process started. If there should be a wound, crusts should be removed, pus cavities or accumulations evacuated, and the wound thoroughly washed out and cleansed in accordance with surgical principles. Solutions of bichloride of mercury (1 to 1,000 or less) may be used for this purpose, or of carbolic acid, two to three per cent, or any other antiseptic preferred may be selected. The necessary object to be attained will be not only the thorough disinfection of the focus, but the retention also of that condition at this point, so that the source of the infecting material may be cut off or its supply diminished. When the point of entrance was in the nose, I have obtained most signal benefit from the use of a spray of ℞ hydrarg. bichlor., gr. j; eucalyptol, gr. x; benzoinol, ℥j. M. et S. This solution can be used in any small hand atomizer by the patient himself, or by his nurse or attendant. It should be thoroughly applied, at first every hour, then at longer intervals, every two or three hours. If the focus from which the disease started is in the mouth and easily reached, it should be dealt with by direct applications; or, if not, by the use of the above spray or of some other antiseptic.

Besnier recommends for the local treatment of erysipelas that the surface be covered with permanent dressings of borated lint, or with compresses of muslin impregnated with a solution of salicylate of soda (1 in 20). Kaposi would either leave the affected surfaces uncovered, or cover them with dry cotton, or with compresses wet with water, or with a solution of subacetate of lead or of acetate of alumina, or he applies an indifferent ointment. Other remedies recommended by various observers are a camphor ointment (℥j ad ℥j), or one of sulphate of iron (℥j ad ℥j), by Velpeau; ordinary white-lead paint, by Barwell; a saturated aqueous solution of picric acid, by Tassi, etc. The application of warm lead and opium wash finds many supporters, as does also the painting over of the surface with tinct. iodini. My personal experience has led me to adopt ichthyol by preference, owing to the immediate and surprisingly beneficial effects which it appears to exert upon the disease. The ammonium ichthyol may be used either in the form of an aqueous solution, or in oil, or in an ointment (fifteen to twenty-five per cent), according to the severity of the local symptoms. The affected area, and a good distance beyond it, should be kept constantly covered with the applica-

tion. I have also used it in my Bassorin paste (Bassorin Paste, etc., Journ. of Cutan. and Genito-Urin. Diseases, 1891 and 1892) with as good results as in an ointment or in another form. When the erysipelas is in the hairy scalp, the ichthyol can best be applied in combination with an oil, preferably in ol. amygdal. dule., aq. calcis, āā partes æquales. It is unnecessary to cut or shave off the hair. I have also applied the ichthyol in solution in alcohol and ether (āā) as a spray, but it is usually objectionable to the patient, though efficacious. After applying the ichthyol, the surface may be left uncovered, or covered with sheet lint or cotton, etc., but I have not observed any particular advantage from either. The ichthyol in every instance has seemed to exert a powerful influence in limiting the area implicated by the erysipelas, in stopping its extension and progression, and in hastening its involution. The patient has experienced comfort, the temperature has fallen, and convalescence has been quickly established. Lactate of lead has also frequently proved very useful in my hands, in the strength of ten to fifteen per cent in ointment form.

Among remedies recommended for the purpose of limiting the extension of an erysipelas, collodium and nitrate of silver may be mentioned. A zone is painted with these around the affected area, but the results obtained are not very great. Hueter and others claim to have stopped the local extension of an erysipelas, by daily injecting subcutaneously at the periphery a one to two per cent solution of carbolic acid. Krause has recommended superficial scarification and subsequent application of wet dressings of a solution of bichloride of mercury. Kaposi has seen much benefit in erysipelas of the trunk and the extremities from the use of the continued bath.

A portion of the treatment of an attack of erysipelas must of course be directed against the possibility of auto-infection as well as transmission of the disease to others. Absolute cleanliness of the patient's hands, etc., and of the instruments used, should be seen to, and, besides, more or less complete isolation recommended.

ERYSIPELOID (Rosenbach). (GEORGE T. ELLIOT.)

Synonyms: Erysipelas Chronicum; Erythema Migrans, etc.

Definition.—Erysipeloid is an erysipelatoid inflammation of the skin, which develops in a wound as the result of its infection with certain special micro-organisms found in dead or decomposing animal matter.

Symptomatology.—The process manifests itself primarily under the form of a sharply defined, slightly elevated, dark, violaceous, almost livid-red zone, which develops around the point at which the infection

has taken place. Accompanying it, there is a marked sensation of burning, itching, and prickling. In its further course, the area of redness extends peripherally, and at the same time involution and fading of the portion first attacked takes place, and the process advances in this way, progressively undergoing involution as it marches into new territory. The progress of erysipeloid is slow, and it may require a week to extend from the tip of the finger to its root. Often during its extension, a portion of the periphery may subside and the skin become normal again, the morbid appearances being then represented by a serpiginous, festooned, or scalloped border of varying width, but yet sharply defined, bounding a surface slightly yellowish in color, but *not scaly*. If several points of infection have occurred, there may be several or more of these progressive lesions on the affected surface, as, for instance, the fingers, the palms, or the backs of the hands. During the entire course of the process the itching and burning persists, being oftentimes exceedingly annoying.

When erysipeloid subsides, the redness disappears slowly, giving place to a yellow color, which may persist for some days. No desquamation or scaling of the epidermis, however, occurs.

As complications or conditions which may arise from erysipeloid, fissuring may be mentioned. They were seen in cases in which the palms were affected, and when the disease was located on a surface subjected to the movements of flexion and extension. Pustular lesions or furuncles may also develop and coexist with erysipeloid, but their presence is accidental, and independent of the latter.

Pathology.—According to Rosenbach (Verhandl. d. deutsch. Congress f. Chirurgie, 1887), the cause of erysipeloid is a micro-organism which exists in dead and decomposing animal matter. It belongs probably to the family of the *Cladothrix*. He first thought it was a coccus, and represented by irregular round or oval bodies, somewhat larger than staphylococci; but in cultures made later, he found that when they had reached a certain age a closely woven mass of fine threads of various lengths had developed. As evidence and proof of the pathogenic nature of the micro-organism, Rosenbach's experiments are conclusive, he having produced typical erysipeloid by inoculation of pure cultures. The symptoms developed usually within forty-eight hours.

Etiology.—Erysipeloid occurs as frequently among males as among females, and is not influenced in any way by the condition of the general system. The only requisite for its production is a small wound—a scratch or other surface lesion, which may serve as a point of entrance for the infecting agent, and contact with matter containing the micro-organisms. Owing to the character of the media in which these exist, occupation is an important predisposing factor, and erysipeloid is in consequence found most usually and frequently among cooks and those doing kitchen work,

butchers, dealers in game, fish or shellfish, etc. Besides these, it may also develop upon those who accidentally or otherwise come in contact with the infecting material and become inoculated. Putrid cheese is mentioned by Rosenbach, and the most intense case met with by myself was in a man whose occupation was that of cleaning poultry. Women who do their own housework, cook, etc., are also exposed to contract the disease. It is claimed that it is not contagious or communicable from one person to another, but, to judge by a case of my own, the disease is auto-inoculable. In this patient the erysipeloid began on the fingers and shortly after developed on the toes, which she was in the habit of scratching (Elliot, Journ. of Cutan. and Genito-Urin. Dis., 1888).

The locations especially favored by the process are the fingers and the hands—that is to say, those portions of the body which are the most liable to come in contact with the infecting material; but, the necessary factors existing, the erysipeloid may of course develop upon any portion of the body.

Diagnosis.—In making the diagnosis of erysipeloid, attention should be given to the patient's occupation and the location of the lesion, and these—taken in conjunction with the superficial seat of the process, its slow creeping course, the absence of scaling during involution, and the entire want of reaction on the part of the general system—should sufficiently characterize it so as to render its recognition an easy matter.

True erysipelas may be differentiated from it by the systemic disturbance ushering in and accompanying an outbreak, by the deeper implication of the tissues, its more rapid course, and by the subsequent desquamation. *Erysipelas migrans* may possibly be mistaken for erysipeloid, but impossibly if the great debility, emaciation, fever, etc., accompanying the former are considered. *Tinea circinata* of the hands and fingers may be recognized by the scaliness of the patches, the small crusts or vesicles frequently seen at the periphery.

Duration and Prognosis.—The duration of the disease is not limited to any definite period of time. Rosenbach states that it may undergo a spontaneous cure in one, two, or three weeks, but according to my observation it may last longer—four and even six weeks. If continual reinoculation takes place, the duration of the process may be of any length of time.

The prognosis is always favorable, as it is a benign disease, without any ulterior consequences to the part affected or to the general system.

Treatment.—Erysipeloid being a mycosis purely local in its effects, the only treatment indicated is the local use of such remedies as will destroy the micro-organism. Any antiseptic or parasiticide may be used, such as acidum carbolicum (3 j ad 3 j) in an ointment, or hydrarg. bichlor. (gr. ij ad iv ad 3 j, ungt.), or resorcin, ten per cent, or tannic acid, fif-

teen to twenty per cent. The best results have been obtained by me from ichthyol, ten to fifteen per cent, in ointment form, the disease yielding completely to it in a very few days.

PELLAGRA. (GEORGE T. ELLIOT.)

Synonyms: Mal Rosso; Mal del Sole, etc.

Definition.—Crocker defines pellagra as an endemic, trophoneurotic disease of toxic origin, produced by diseased maize, and affecting the cerebro-spinal, digestive, and cutaneous systems.

Symptomatology.—The disease is said to appear under many forms, and to run an acute or a slow, chronic course. In the early stages, there is in the spring a feeling of weakness, dizziness, headache, and a burning sensation. The tongue is coated, and there are anorexia and a diarrhœa. The cutaneous eruption appears on those portions most exposed to the heat of the sun, as the backs of the hands, the face and neck, in the form of erythematous patches of a dark brown or livid red. The skin is swollen, burns and itches. Small bullæ may form and pigmentation develop. Toward fall and winter, there is some desquamation and the erythema disappears. It recurs again in the spring, and may follow this course for a number of years, when the skin on which the erythema occurs becomes dark olive brown and desquamates in thick flakes. The patient gets weak and emaciated: severe headaches occur; paralysis and changes in the fundus oculi are mentioned as frequent. The cutaneous symptoms gradually extend over the body, the skin becomes bluish-red or bronzed in color, the finger joints are contracted, a sensation of cold and formication is complained of. Mental disturbances occur—insanity, delirium, stupor, melancholia, etc. Paralysis of the limbs and bladder, diarrhœa, and chronic and acute diseases of the lungs and heart develop, and the patients die from some one of these complications or from marasmus. The disease lasts from five to fifteen or more years.

Pathology.—Lambroso states that it is due to a toxic effect on the sympathetic and vagus (Crocker), of a toxine which is formed in decomposing maize, and which produces effects analogous to ergotism. Pachymeningitis, cerebral and spinal cord sclerosis, hyperæmias, and inflammatory processes have been found post mortem, as well as atrophic conditions of internal organs, fatty degenerations, and pigmentary changes. These latter are said to be characteristic of the disease.

Etiology.—It occurs most frequently in the poorest classes in women between the ages of thirty and fifty, and is especially common in certain districts in Italy, though it is also met with elsewhere. Its immediate cause is a toxine formed by decomposing or fermented maize. Lambroso

produced the disease by the administration to men of the substances isolated by him from such maize, viz., a fatty oil and an extractive (*pellagrozein*). Kaposi, however, mentions cases which developed entirely independently of any such cause, and states that the etiology of the disease is still obscure. It is not contagious and improbably hereditary.

If the attacks are slight, and the patient can be brought under good hygienic conditions and proper food, the prognosis is favorable. It may disappear of itself, but more often the injury to the nervous system is severe, and a fatal result is very usual.

Treatment.—Not much can be said concerning the therapeutic measures employed against pellagra. Good food and a liberal, nourishing diet, proper hygienic surroundings, etc., are especially indicated. Whatever symptoms arise should receive proper medication. Hydrotherapy is recommended, and especially arsenic.

ACRODYNIA. (GEORGE T. ELLIOT.)

Synonyms: Erythema Epidemicum; Cheiropodalgia, etc.

Definition.—An acute, epidemic, and general disease, attended with disorders of the nervous system. It is especially characterized by pains in the extremities and an erythematous rash on the skin, followed by thickening of the epidermis, desquamation, and pigmentation. It has been observed most frequently in the East, but also occasionally in Europe.

Symptomatology.—During the period of invasion, there are digestive disturbances, anorexia, nausea and vomiting, and sometimes severe diarrhœa. Often œdema of the face, hands, and feet develops from the first, and the nervous symptoms are marked. These consist of numbness, formication, and shooting pains in the feet and hands, an intolerable sensation of heat, cutaneous hyperæsthesia, and sometimes anæsthesia. Muscular hyperæsthesia, cramps, spasms, and painful contractures may also be present.

Conjunctivitis is of frequent occurrence. The lesions of the skin are represented by erythematous patches on the palms and on the soles. They are quite marked on the phalanges, which are swollen, strongly resembling chilblains. The skin, especially of the abdomen, the neck, and of the articulations, becomes often brown and discolored. On the hands and feet, papules, bullæ, furuncles, and copper-colored spots arise. The epidermis is thickened and exfoliates in large flakes. Ecchymoses, cyanosis, and superficial gangrene have been noted. The disease lasts from two to four weeks, and relapses are not infrequent. It is seldom fatal, and recovery takes place in a few weeks or months.

Pathology.—Vidal and Leloir, Kaposi and others consider it as due

to some toxic agent acting on the nervous centers, particularly of the cord. They also point out that the cutaneous symptoms are strikingly analogous to those of alcoholism, chronic arsenical intoxication, and the erythema of pellagra. The disease is thought to be related to pellagra.

Vidal and Leloir state that there are no characteristic anatomical changes. Tosquinet, however, found three times inflammation of the pia mater and spinal arachnoid. Camberlin found in two cases lesions of the cord and arachnoid.

Etiology.—There is no etiological cause known. Some mention grain which had become decomposed.

Treatment.—Brocq says that the only medication of any avail was counter-irritation over the spinal cord.

FURUNCULUS. (S. POLLITZER.)

Synonyms: Furuncle, Boil; Ger., Blutschwär; Fr., Furoncle.

Definition.—An acute circumscribed inflammation of a hair-follicle, sebaceous gland and the neighboring connective tissue, terminating in suppuration and necrosis of the central portion of the affected region.

Symptomatology.—The affection begins as a minute reddened point, to which the patient's attention is called by a slight itching or burning. On palpation a slight infiltration may be detected. Generally a lanugo hair pierces the middle of the reddened point. After twenty-four hours the area of redness has spread, the infiltration is more marked, and the skin is raised into a flat, conical nodule, at whose apex a minute vesicle, filled with clear, later cloudy serum and pus, may be seen. The roof of this vesicle is usually rubbed off and a yellowish crust takes its place, under which a little pus gathers. Meanwhile the infiltration extends laterally and in depth, and there is now a considerable conical elevation of the skin.

Three or four days from the beginning of the process the furuncle consists of a pustule on an elevated, reddened, infiltrated basis, disproportionately large for the small amount of pus. Around the pointed, yellowish-white apex of the cone the skin is deep red in color, hot to the touch, and extremely tender; the redness is usually sharply limited. Sometimes the process comes to an end in this stage; the pustule dries up, and the infiltration is gradually absorbed. This course is, however, rare. If the pustule be opened, a few drops of thick pus exude, and a yellowish-white point, which can not be removed by ordinary manipulation, is disclosed in the center of the crateriform opening. A crust forms anew over the opening and pus accumulates again under it. In

the meanwhile the process has advanced considerably. The infiltration is more extensive, the furuncle may be felt as a firm tumor, extending deep into the subcutaneous tissue, from a hazelnut to a small hen's egg in size; the skin has a bluish-red hue, and in the large furuncles there is a peripheral zone of œdema.

The pain is of an intense throbbing and grinding character, augmented by any cause which increases the venous congestion in the part. The pain is intensified by contact or motion of the part, and the patient therefore tries to avoid adding to his discomfort by muscular efforts, to keep the affected region as quiet as possible, and to prevent friction by his clothing, etc.

During the next few days the middle of the furuncle becomes more and more prominent, and in its center the head of the "core" may be seen as a yellowish-white point, while the surrounding thin, bluish-red skin pushed forward by the pus underneath may form an annular prominence above the center. Finally, in the case of large furuncles, on the fifth or sixth day, the pus breaks through, generally during some sudden muscular effort, sneezing, coughing, etc. The rupture occurs at the border of the "core," and is followed by the discharge of a small quantity of thick, greenish-white, at first bloody pus. We have now a crateriform opening with thin, ragged edges, and in its middle the central necrotic mass, the "core," may be seen, attached firmly at its base and surrounded on its sides by a clear space. On pressure, pus may be made to exude, but the core itself can not be moved. With the discharge of the pus there is a slight diminution of the pain and subjective symptoms. The opening generally closes soon; pus reaccumulates under the crust, and after another day or two rupture again occurs, the core this time being discharged, together with a considerable quantity of creamy pus. The core varies considerably in size in different cases, from a pin's head to a pea. In its place there is now a cavity extending to the subcutaneous tissue, wider below than above, its walls lined with small, pale red granulations, and here and there shreds of necrotic tissue.

With the discharge of the core the pain ceases at once, the swelling and infiltration decrease rapidly, and the redness fades at the periphery, though around the orifice a bluish-red color persists for many weeks. Within twenty-four hours of the discharge of the core the walls of the crateriform cavity are collapsed, the cavity filled with granulations which discharge a yellow, serous pus. In the course of the next two or three days the secretion becomes clear and presently ceases, and the process of repair is completed within a week. A small, round, slightly depressed bluish scar persists, the cutis still feels hard, the horny layer peels off in thin, large flakes around the affected region, and the new skin has a reddish, smooth, shiny appearance, which it loses only after months, and

which gives place to a yellowish-brown pigmentation which persists sometimes for many years.

In addition to the furuncle, of which the typical course is here described, there is another variety known popularly as the "blind boil," which differs from the typical boil chiefly in that no core, no central necrotic mass, is developed. Its course is in general like that described above, except that its symptoms, objective and subjective, are not so severe; and it is of shorter duration, lasting usually but four or five days. As in the typical boil, a considerable crateriform loss of tissue results, and it is probable that the absence of a core depends on the circumstance that the necrosis affects only minute particles of tissue, which are swept away in the first flow of pus.

The constitutional symptoms accompanying the development of a boil are in proportion to the intensity of the local manifestations. Large furuncles are frequently accompanied by fever, and a chill may occur at their beginning. At the height of the development of the boil there are usually some fever and decided *malaise*. All these symptoms disappear with the discharge of the core. The general reaction is particularly marked in the case of furuncle located in the face, even when the boil is small, and there may be even symptoms characteristic of septic fever—restlessness, delirium, and coma.

Boils occur either singly or in groups or in a succession of crops, in the last case constituting the condition known as *furunculosis*. The most frequent site of such crops of furuncles is the neck, the back, and the thighs, though they may occur indiscriminately over the whole integument. The face and the hands and feet are rarely affected.

As a rule, the first furuncles appear singly at intervals of several days or weeks; then a group of half a dozen may develop almost simultaneously, and thereafter, as long as the condition continues, hardly a day may pass without one or more furuncles appearing. There is generally some elevation of the body temperature, especially at night, the patients are much reduced by the constant pain and the want of sleep, their appetite is disturbed, and sometimes a hectic state develops. The condition may last for months or even years, and finally a particularly virulent boil or a carbuncle may carry off the weakened patient.

As a rule, of course, furunculosis has a favorable termination. The number and severity of the boils are moderate, the patient's general health is but little or not at all affected, and the symptoms often cease spontaneously without any apparent reason. Some individuals suffer annually at particular seasons—in the spring or autumn especially—from moderate furunculosis.

Anatomy and Pathology.—A vertical section through a boil near the height of its development will show under the microscope the epider-

mis thinned and the rete pegs obliterated. In the middle of the affected region there is a mass made-up of swollen connective-tissue bundles, elastic fibers, blood-vessels filled with fibrin clots or granular detritus, and a few remains of epithelial cells from the sebaceous gland and root-sheath of the hair-follicle. Nuclei of cells in this central portion take stains but feebly. Around this mass there is a zone of dense infiltration with leucocytes and pus cells, while the neighboring connective tissue also contains large numbers of leucocytes, the infiltration extending far down into the subcutaneous fat following the *columnæ adiposæ*. The blood-vessels are distended, and surrounded for a considerable distance by emigrated cells. Micrococci can usually be found in the central necrotic mass and the surrounding zone by suitable stains.

The development of the central necrosis may be explained as resulting from the relatively rapid action of the chemical poison generated by the infecting germs. The blood supply is cut off by thromboses of the capillaries, and the cells killed *en masse* are not subject to subsequent invasion and softening by leucocytes. In the case of blind boils the quantity of poison generated is not sufficient to cause the sudden death of large masses of cells.

The pathological process consists in an acute inflammation of the tissues surrounding a hair-follicle, due to infection by way of the follicle with pyogenic organisms, generally the staphylococcus pyogenes aureus. This germ can almost invariably be isolated—generally in pure culture—from the pus before rupture of the skin has occurred, and inoculation with the pure culture on the unbroken skin, or with pus from a boil, by careful friction with a sterilized spatula, so as not to rupture the horny layer, will produce a boil.

The popular notion that boils are caused by “impure” blood or by too rich a diet need not be discussed seriously here. There is no doubt, however, that infection takes place more easily in some individuals than in others, and some of the causes on which this predisposition depends will be discussed under the head of Etiology. Inasmuch as the property of developing pus is not limited to the staphylococcus pyogenes aureus, it is not impossible that boils may at times be produced by inoculation with other germs. Pyogenic organisms are always on the skin, and boils occur most frequently in those regions of the skin in which the opportunities for inoculation by friction with the clothing are most favorable—i. e., the neck, the shoulders, and the nates.

Etiology.—The immediate cause of a furuncle is, we have said, an infection through the hair-follicle. Certain conditions favor the probability of the occurrence of such an infection. These are to be sought either in the condition of the skin itself, of the system in general, or in the occupation and habits of the individual.

1. Naturally, those people whose occupation brings them in contact with substances prone to decomposition run the risk of becoming infected with the germs which occur abundantly in such substances. In this category we may put butchers, tanners, cooks, rag-dealers, scavengers, surgeons, etc.

2. The finger nail is commonly the *nidus* for innumerable germs; furuncles develop frequently, therefore, in all pruritic conditions of the skin—e. g., pediculosis, scabies, eczema, prurigo, etc.

3. The habits of personal cleanliness play an important rôle in the etiology of furunculosis. Germs that are allowed to remain on an unwashed skin, mixed with ancient and decomposing secretions, may readily find an opportunity for breaking into a hair-follicle and setting up a furuncle.

4. The application of plasters, salves, vesicants, or even a simple cold-water compress (Priessnitz) favors the development of boils in a mechanical way, by rendering the follicular mouths patulous, or in the case of salves (which are not themselves antiseptic), because germs may be driven into the follicles by the friction employed in their application.

5. No doubt the germs do not flourish equally well on all soils, and there are pathological states affecting the blood and tissue-juices which appear to afford a particularly favorable ground for the development of germs and furuncles. The disorders affecting the general nutrition, in which either isolated or multiple furuncles are of very common occurrence, are diabetes, Bright's disease, tuberculosis, gout, chronic disorders of the digestive organs, and disturbances of menstruation. In the period of convalescence after typhoid, scarlatina, and in anæmic individuals boils are of common occurrence.

6. Finally, certain general hygienic conditions are of importance in the etiology of furunculosis. Boils occur at times almost like an epidemic in badly ventilated or damp buildings in which many individuals are crowded together—as in barracks, hospitals, asylums, etc. The more common occurrence of furunculosis in the spring may be attributed to two factors: with the return of warmer weather there is much more decomposition, which was held in check by the cold, and therefore more *materies morbi*; and, secondly, the skin itself, kept moist by the perspiration, is a more favorable soil for the growth of germs.

Solitary boils occur at all ages; they are somewhat less frequent in infancy and in old age. Furunculosis, however, is more frequent in infancy and at puberty than at other periods.

Diagnosis.—The affection is so well characterized, and so well known popularly, that its diagnostic points need not be discussed. Its

differential diagnosis from carbuncle and from hidradenitis, with which it might under some conditions be confused, will be discussed under those diseases.

Prognosis.—The prognosis in the case of solitary furuncle is good except in rare cases. As a rule, the patient is not even prevented from attending to his usual occupation. The prognosis is more serious, however, in the case of furuncles located in the leg that have become irritated by injudicious treatment, or by the patient's engaging in hard labor or tedious marches. Lymphangitis, lymphadenitis, suppuration of glands, and even embolism with septic matter, and death from pulmonary embolism may follow in these cases. Furuncle of the face is always to be regarded as an affection not to be trifled with. The possibility of phlebitis extending into the cranial cavity, producing sinus thrombosis and purulent meningitis, must be borne in mind; and the large lymphatics and rich vascularization of this region increase the chances of embolism into the lungs.

The prognosis of furunculosis is serious only in so far as it complicates a pre-existing pathological state, like diabetes, Bright's disease, etc. In these conditions there is danger that a carbuncle may develop. In patients reduced by any cause, furunculosis may delay convalescence. In the majority of cases, however, the patients are but little disturbed by the process, which merely produces a certain amount of discomfort, but has little or no effect on the general health.

The prognosis as to the duration of furunculosis is always uncertain; it depends largely on the treatment, but the process continues sometimes indefinitely, even under the most favorable conditions.

Treatment.—The treatment of a furuncle may be divided into treatment directed toward aborting the inflammation, and that which aims at hastening the process and directing its course to a favorable termination with the least possible discomfort to the patient. The attempts to cut short the inflammation in an early stage and to prevent the formation of the central necrosis are, it must be admitted, failures in the great majority of cases. The germ is already in the depths of the cutis when the affection is clinically recognizable, and no application to the surface can be of much avail. No doubt, however, an effect may be produced on the circulation in the part, and thus on the medium in which the germs are developing, by the application of strong revulsives, and this effect may be in favor of the tissues and against the infecting organisms. To this extent the employment of cauterization with a sharp stick of nitrate of silver, or painting the affected region with iodine, or the frequent and long-continued use of the carbolic spray, after the method of Verneuil, seems permissible to the rational therapist. The use of plasters, especially the mercurial carbolic-acid plaster of Unna (made by Beiers-

Toward the end of a week small yellowish areas occupy the former site of the pustules (indicating the position of necrotic masses below), and increase in number toward the periphery of the affected region. The intervening skin is dark bluish-red, tense, and shining, and an oedematous swelling extends far beyond the borders of the patch. This oedema is particularly marked in cases of carbuncle of the face or scalp. The pain is of an intense, throbbing character, and generally robs the patient of sleep. Sometimes the pain ceases, though the local symptoms continue, and the patient remains fully conscious. This cessation of local pain is always a bad sign, indicating the sudden necrosis of the tissues *in toto*.

In the most favorable cases the process attains its maximum intensity after eight to ten days. Suppuration occurs around each necrotic mass, the epidermis gives way at every yellow point, pus and a necrotic core are discharged from each opening, and the swelling and tension recede; the process remains limited to the area of original infiltration, and the cavities formed by the loss of tissue are soon filled by granulations. Commonly, however, the tense infiltration spreads peripherally after the necrotic plugs in the center have already formed, so that the carbuncle may finally occupy a very large area. New masses of tissue at the periphery become necrotic; the discoloration becomes darker; the epidermis is raised up in blisters filled with dirty reddish serum. Meanwhile pus has been gathering in the subcutaneous tissues, and by its pressure is forced out, toward the end of the second week, at the side of the necrotic plugs. The skin is thus perforated almost simultaneously at many points, and the discharge of large quantities of pus, mixed with blood and shreds of necrotic tissue, is soon followed by that of the plugs themselves. The affected region is now honeycombed by numerous round openings and undermined to a large extent, so that the middle of the carbuncle sinks below the surrounding level. The subcutaneous fat and connective tissue now become in part necrotic, and the skin itself begins to break down. The perforations enlarge and coalesce, and finally the entire subcutaneous pus-cavity is exposed. As a rule, the affection attains its height at this stage and the process of repair begins.

It happens sometimes that, instead of this gradual breaking down of the skin, the entire surface becomes at once gangrenous and breaks down into a dark, discolored pulp. Or, again, in old, decrepit individuals with but slightly developed adipose layer, the necrotic skin may become dry and leathery, undergoing a kind of mummification. Occasionally the boardlike infiltration at the periphery persists and spreads, the necrosis and suppuration making the pus-cavity of greater area than is indicated by the loss of tissue on the surface. Only in exceptional cases of prolonged course does the process extend through the subcutaneous fascia and into the muscles, or even into the periosteum. E. Weber (Virchow's

Archiv, xii) has described these rare cases as chronic carbuncle; their duration is often measured by months. Monnier has described a case in which the destructive process involved the spinal column and exposed the cord, death ensuing from spinal meningitis. It is a remarkable fact that the lymph glands are practically never involved in carbuncle.

In typical cases of carbuncle the process comes to a standstill after two or three weeks, rarely lasting four weeks. The first signs of the favorable turn of the process consists in a reduction of the surrounding œdema and infiltration. Presently a few granulations appear on the floor of the ulcer; the discharge of pus and shreds of tissue becomes less; the number of granulations increases and soon fills out the entire cavity. Meanwhile the peripheral infiltration becomes absorbed, and the tension and redness of the skin disappear, leaving a finely wrinkled epidermis which soon peels off. The granulations which spring from the floor and sides of the ulcer unite, and the epidermization and cicatrization soon begin. The process of repair, however, though continuous, is at best tedious, lasting five or six weeks. The resulting scar is always considerable, often radiate or with linear streaks; the skin over it is firmly united to the subcutaneous fascia and is immovable.

The course of a carbuncle is not always favorable. The thrombosis of the veins in the affected region may advance to deeper parts. This complication occurs most frequently in carbuncle of the head, especially the lip and the scalp. Thrombosis of the sinus with purulent meningitis and death follow. The course of the thrombosis and purulent phlebitis is generally through the facial vein and the ophthalmic to the sinus; exceptionally the process extends even through the middle meningeal vein to the jugular. Another source of danger lies in the possibility of embolism with septic fragments from the venous thrombi, leading to general pyæmic infection and numerous metastatic abscesses. So, for instance, embolism into the lungs, into the central artery of the retina, etc., have been observed. Diffuse metastatic inflammations, pleuritis, pericarditis, etc., have been recorded. In very rapid and extensive cases death may supervene from acute sepsis, even before suppuration of the carbuncle has developed. The cause of death in the majority of cases, however, is exhaustion.

The constitutional symptoms vary greatly in different individuals and in different cases. Small carbuncles sometimes produce the most violent general disturbance, while in those of great extent the constitutional symptoms are sometimes but slight. The fever, initiated often by a chill or rigor, may be very high, and continues usually till the discharge of the subcutaneous pus. It persists often after this period, assuming then the characters of a septic fever. The general *malaise* is always marked; the appetite is in suspense; the tongue is furred; the pain robs the patient

of sleep; delirium of a mild character is common. Later in the course of the disease there is great feebleness and prostration.

The most frequent site of carbuncle is the back of the neck and the back; less commonly the buttocks, the thigh, usually its anterior aspect, the scalp, the face, especially the upper lip; very rarely the arm and anterior surface of the trunk.

Anatomy and Pathology.—From an anatomical point of view a carbuncle is not to be regarded as a group of contiguous furuncles, but rather as a furuncle with phlegmonous infiltration of the neighboring tissues. Carbuncle differs from furuncle chiefly in its greater tendency to spread laterally, and in that the inflammation leads to gangrene. No anatomical studies of the earliest stage of carbuncle have been made. We may safely assume, however, that, as in furuncle, the process begins in a hair-follicle and sebaceous gland. Certain it is that carbuncle never develops on the palms and soles, where there are no hair-follicles or sebaceous glands, and that its place of predilection is those regions in which there are large sebaceous glands located deeply in the cutis—e. g., the back, the neck, and the face. Warren (J. Collins Warren, Boston Med. and Surg. Journ., 1881, and *Columnæ Adiposæ*, etc., its Pathological Significance in Carbuncle, etc., Cambridge, 1881) has shown that the process may be traced to a hair-follicle surrounded by pus cells, whence it spreads downward to the subcutaneous fat, while at the same time the superjacent skin becomes necrotic. The area of the necrotic patch is in direct proportion to the mechanical resistance which the skin presents; the necrosis is more extensive, for instance, in the tough skin of the neck, somewhat less in that of the back, still less in the face. The suppuration spreads in the subcutaneous fatty tissue, and then rises again to the surface, following the lines of the *columnæ adiposæ*, producing thus the clinical picture of a region undermined by pus before the necrotic cutis has sloughed, and perforated in numerous points.

A section through a fully developed typical carbuncle shows macroscopically the cutis and subcutis enormously thickened, and of a uniform firm consistence and reddish-gray color, crossed by numerous yellowish-white conical masses, the necrotic plugs, which extend from the areolar tissue to the surface. Here and there are hæmorrhagic patches, and the patulous vessels are filled with dark thrombi. At the periphery, islands of grayish-yellow necrotic tissue may be seen in the lower layers, lying in the darker infiltrated skin. The microscope reveals but little characteristic. In the necrotic masses nothing of the normal cellular elements can be made out. The normally less compact structure of the areolar tissue permits of an infiltration with round cells so dense as to completely obscure its normal lines. The entire region is infiltrated by granular or clotted fibrin.

Micro-organisms occur abundantly in the tissues of a carbuncle. They are of the same character as those found in furuncle—the *staphylococcus pyogenes aureus*. There is abundant evidence that pus from a carbuncle inoculated on the skin of another person may set up a furuncle; and the possibility of the development of carbuncle out of a furuncle has already been referred to in the last chapter. Why the same germs inoculated in the same way (through a hair-follicle) should produce now a furuncle, now a carbuncle, we do not know. Riedel (*Med. Wochenschr.*, 1881) believes that carbuncle develops always out of a furuncle, situated deeply and covered by tense epidermis, so that the surface does not lie in the direction of least resistance, the process naturally extending, therefore, laterally and downward.

Etiology.—It must be clear, in view of the intimate relations existing between carbuncle and furuncle, that what has been said under the head of Etiology of the latter disease applies equally to the former. Carbuncle occurs very rarely in infancy and childhood, seldom in young adult life; it is most frequent after the fortieth year. Both sexes are equally subject to the affection, which, it must be observed, is, in contradistinction to furuncle, by no means common.

Diagnosis.—The diagnosis of carbuncle presents little difficulty after the affection is fully developed. The occurrence of several necrotic points in the middle of a round, prominent, hard infiltration, is characteristic. In addition, the location of the process, and the presence, perhaps, of an affection which, like diabetes, disposes to carbuncle, are points of importance. Carbuncle in an early stage may be mistaken for furuncle, for erysipelas, for diffuse or circumscribed phlegmona, and for anthrax. From furuncle it is readily differentiated after twenty-four hours' observation. Erysipelas of the face accompanied by much œdema resembles carbuncle in its early stages, and confusion between these two affections may be of the most serious consequence in view of the treatment. The presence of the boardlike infiltration in carbuncle, and later the development of the necrotic plugs, are differential diagnostic points. The differential diagnosis between carbuncle and diffuse or circumscribed phlegmona of the face is sometimes extremely difficult. In phlegmona the swollen infiltrated patch is generally anæmic and pale, while carbuncle begins with a deep red discoloration. The diagnosis between carbuncle and malignant pustule, or anthrax, is of importance chiefly from the point of view of prognosis. Anthrax begins as a sharply circumscribed reddish patch, capped by a vesicle filled with dirty serum, in which the characteristic anthrax bacilli may be demonstrated already on the second day. The patch becomes rapidly discolored and very soon gangrenous; at the same time the center of the patch sinks below the surrounding level, while in carbuncle the center is elevated. Very soon a number of

vesicles appear, arranged in a ring around the discolored center—a picture which is unmistakable.

Prognosis.—Carbuncle is always to be regarded as a serious affection. The prognosis is bad in the senile, in diabetics and alcoholics, and in individuals reduced by any cause. The prognosis is doubtful in carbuncle of the face and the scalp. If delirium and sopor occur soon, or if the dense infiltration progresses rapidly, the prognosis is grave. In short, the more rapid the progress of the disease and the sooner the symptoms of sepsis develop, the more unfavorable the prognosis. In carbuncle of the face, even if the life of the patient is not in danger, the certainty of a large and disfiguring cicatrix should be borne in mind. The prognosis is the more favorable the sooner a rational system of treatment is adopted.

Treatment.—The indications for treatment of carbuncle are simple, and the host of methods of treatment, most of which date from the pre-antiseptic period, need not all be considered here. Among the older methods, treatment by cauterization is alone worthy of mention. Cauterization may be made by chemicals, or with the actual cautery. Of chemical caustics, potash—*potassa fusa*—has many advantages. Little sticks of caustic potash are to be pushed under the skin, alongside each necrotic core, and through small incisions at the periphery of the affected patch. A single thorough application should suffice. The great merit of the method lies in the rapid destruction and liquefaction which ensue, and potash is to be preferred to any caustic which produces merely a dry slough. The after-treatment consists in the application of warm poultices, to favor the removal of the sloughs, and the cavity may then be packed with charpie, iodoform gauze, etc.

The actual cautery may be used on the same principle—the carbuncle is simply burnt out—and the after-treatment is the same as when potash is used. The objection to these methods—which, it must be admitted, are, when properly applied, certainly efficient—lies in the fact that the destruction of tissue can not always be sharply controlled, and the resulting cicatrix may be unnecessarily large, and is always extremely disfiguring.

Treatment by means of warm poultices, or by ice applications, needs hardly be more than mentioned. A poultice actually favors the development and spread of the carbuncle; and cold applications do not check it, while they still further diminish the capacity for resistance of the already damaged skin.

There are only three methods of treatment which wholly commend themselves to the surgeon of to-day—treatment by incision and by excision, and by parenchymatous antiseptic injections. In the first, as soon as possible a linear incision should be made through the center of the carbuncle in such a direction as to pass through the greatest possible number of necrotic plugs. The incision should extend through the infil-

trated border on either side, and clear through the whole thickness of the skin down to the subcutaneous fascia. A second incision of like proportions should cross the first through the center at a right angle. If there are many necrotic points in any of the quadrants thus formed, a few additional incisions may be made into them. The hæmorrhage is considerable, but soon ceases. With forceps and scissors all necrotic portions should be removed, and the removal of small necrotic scraps may be favored by friction with a sponge saturated with an antiseptic solution.

A modification of this method, which may be adopted in particularly virulent cases, consists in curetting out as much as possible of the softened tissues after the crucial incisions have been made. As soon as the bleeding has ceased, the cavities should be stuffed with absorbent gauze, and the whole covered with an absorbent pad, rubber tissue, and bandage. Of course, the entire operation should be conducted on antiseptic principles. The relief following the operation is immediate. The patient feels better, the pain ceases or is at least greatly reduced, the temperature may fall to the normal. Necrotic and gangrenous portions should be removed at subsequent dressings as soon as they become loose, and in a very short time the abscess clears and healthy granulations spring up. In those severe cases in which the infiltration spreads progressively, notwithstanding the incision, the operation may be repeated, new incisions being made into the infiltrated tissue.

The treatment by excision, which has been advocated especially by Riedel (*loc. cit.*), is the most radical, and on both theoretical and practical grounds most to be commended. Unfortunately, it is too severe an operation to be safe in the hands of any but an experienced surgeon. The operation consists in removing at once the entire carbuncle. The field of operation is prepared *lege artis*, a circumscribed or elliptical incision is made through the skin into or just outside of the infiltrated border of the carbuncle, and the entire flap covering the affected region is rapidly dissected off. The bleeding is generally severe; as soon as it has been somewhat checked by compression, the surgeon removes with scissors or curette every particle of necrotic or gangrenous tissue visible in the subcutaneous tissues which lie exposed, clearing off, if necessary, everything down to the fascia. An enormous gaping cavity results, and may lead the inexperienced to expect a frightful cicatrix. Within twenty-four hours, however, the swollen borders are reduced, and the wound appears scarcely more than half its former size. Immediately after the excision, the cavity, after thorough irrigation, should be stuffed with dry absorbent material and covered by an absorbent pad, and the dressings changed after twenty-four hours.

The relief following the operation is instantaneous and marvelous.

The temperature sinks at once, the pain ceases absolutely. The patient, who may have been in a state of delirium and sopor, recovers his normal condition within a few hours. The wound, properly treated, heals promptly, and the scar left is certainly not larger and usually less disfiguring than that following other methods of treatment. The one serious objection to the treatment by excision is the great loss of blood, which in enfeebled subjects may be a serious matter. Excision, however, will probably be practiced only in severe cases, in which the development of early symptoms of sepsis makes radical treatment advisable; and with the aid of a couple of assistants the loss of blood may be reduced to a minimum.

The treatment by means of antiseptic injections is available in all mild cases, and in those in which, for any reason, more radical measures can not be employed. It was proposed by Verneuil, and is the favorite method of treatment in the Paris hospitals. It consists in making injections of a three-per-cent to five-per-cent solution of carbolic acid deep into the inflamed tissues. Six or eight syringes of the solution may be injected at a sitting at different points, into the periphery and alongside the necrotic cores, and the injections may be repeated in six or eight hours unless symptoms of carbolic-acid poisoning develop. Solutions of sublimate, 1 to 500 or 1 to 1,000, may be substituted for carbolic, but the latter is preferable for obvious reasons.

The constitutional treatment in carbuncle should never be neglected. Antipyretics may be indicated by high temperature. Stimulants and tonics should be exhibited to counteract the great depression of the vital forces; alcohol should be freely administered. Morphine is usually required to enable the patient to obtain rest. The diet should be carefully directed with reference to its digestibility and to the nutritive value of foods.

ANTHRAX. (S. POLLITZER.)

Synonyms: Anthrax Maligna, Malignant Pustule; in cattle, Splenic Fever; Ger., Milzbrand; Fr., Charbon.

Definition.—A specific disease with local and general manifestations, due to infection with *Bacillus anthracis*, derived from animals suffering from splenic fever. The general infection of the system through the digestive or respiratory track is followed by high fever, prostration, and death, with hæmorrhages in various regions of the body and enormous congestion of the liver and spleen. We are here concerned only with that form of the disease which follows inoculation through the skin.

Symptomatology.—Within a few hours after the infection has been received the skin at the point of inoculation is reddened, and the

patient is conscious of a slight itching and smarting. After twenty-four hours the area of redness has spread, there is a vesicle or bleb in its center filled with clear serum, and the entire region is considerably infiltrated and resistant. The serum in the vesicle becomes purulent and bloody after a few hours, and the epidermis, soon rupturing, reveals a dark, gangrenous, slightly depressed patch. The infiltration has by this time become intense and sharply defined, the color of the peripheral zone deep scarlet, and the surrounding tissues œdematous. Within another twenty-four hours vesicles on an inflamed base appear grouped in a circle around the gangrenous depressed central eschar, which may be half an inch or more in diameter, and the concatenated glands and lymphatics may be affected. The gangrenous patch sometimes enlarges very rapidly, and general infection follows, leading soon to death; usually it spreads more slowly. If the process cease spontaneously, the gangrenous region sloughs after a variable time, depending on its area and depth, and the resulting cavity heals by granulation, as in carbuncle.

Exceptionally, especially when loose tissue, like the web of the fingers or the front of the neck, is the seat of inoculation, the local manifestation is in the form of a rapidly developing and widespread œdema. The skin assumes a livid hue, the swelling is enormous, gangrenous patches appear at many points, and the epidermis is raised in blebs filled with bloody serum. Spontaneous recovery rarely takes place in this mode of infection, general infection with death following almost invariably.

The local pain is usually slight, and the patients frequently go about with no general disturbance other than slight chills and a mild degree of fever, though the constitutional symptoms vary according to the extent of the gangrene and inflammation. The occurrence of general infection is marked by rigors, vomiting, and pyrexia, the temperature rising often to 106° ; great prostration, feeble and rapid pulse, sweating, diarrhœa, severe pains in the bones and head, and delirium soon follow. Death occurs sometimes after sudden collapse; it may be preceded by coma. Convulsions occur when there is meningeal hæmorrhage; cough, rapid respiration, and cyanosis indicate pulmonary involvement. Sometimes the patient sinks into a typhoid state, and death may be postponed for four or five days after the development of signs of systemic infection. Very rarely the symptoms subside slowly, and recovery takes place after a protracted convalescence.

Anatomy and Pathology.—The inoculation of the specific germ of anthrax into the skin is followed by an inflammatory reaction of the most intense character. This reaction bears the usual signs of inflammation—dilated and in part thrombosed blood-vessels, serous exudation, and leucocyte infiltration. The anthrax bacillus may be found in great numbers in the serum of the vesicle and scattered throughout the entire af-

fecting region. At an early stage the bacillary invasion and the round-cell infiltration are sharply limited. The destruction of tissue—the gangrene—which forms part of the clinical picture, is due probably not less to the thrombosis of vessels cutting off the blood supply than to the direct action of the peculiar poison generated by the bacilli. This poison acts especially on the intima of blood-vessels, and affects it in such a way in the later stages of the disease, when general infection has taken place, as to render the vessels permeable; hence the numerous parenchymatous hæmorrhages. After death the capillaries, especially in the liver, spleen, and kidneys, are found fairly choked with bacilli.

Etiology.—Anthrax in men is derived always by contact with virus from an animal suffering from or dead of splenic fever. The specific

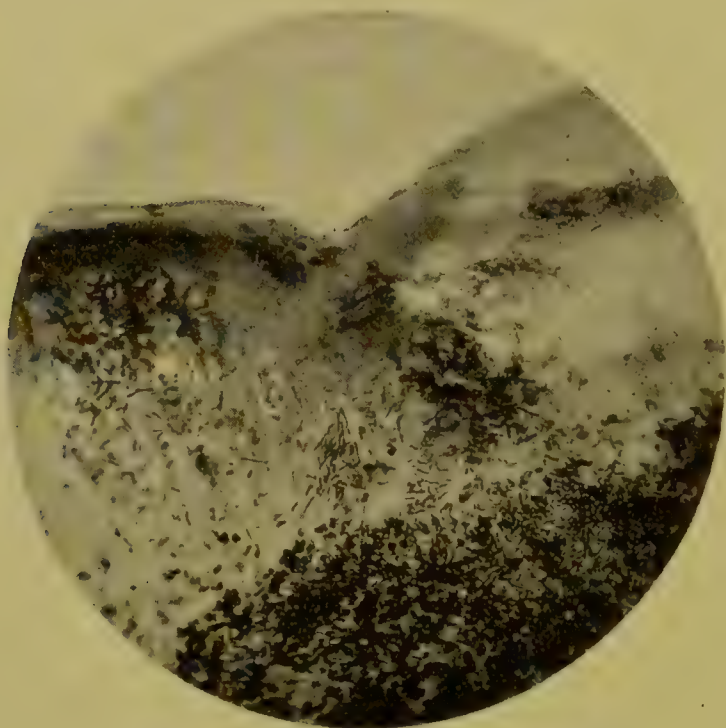


FIG. 17.—From an anthrax pustule of the face, showing bacilli.

germ, which was discovered by Pollender in 1849, has been the subject of elaborate and careful studies, of which the most valuable have been made by Pasteur and Koch. The germ, which is the largest of the pathogenic organisms, is from 5μ to 20μ in length, and about 3μ in width. It develops in the body by fission; outside the body it produces large oval spores, which are extremely resistant, and remain viable for years even when dried. They retain their vitality in the soil around buried carcasses, and are brought to the surface through the action of earthworms, and, when taken into the system by animals feeding on the grass, develop the disease (Pasteur). The disease occurs chiefly among

horned cattle, though other animals, including the carnivora, may become infected.

The disease is communicated to men through the careless handling of infected carcasses, through any slight abrasion of the skin, and may be transmitted through the agency of flies or of stinging insects; or the dried spores in the hides or hair of infected animals may be inhaled with dust. We find the disease, therefore, limited almost exclusively to those whose occupation brings them in contact with the active or dried germ—cattle-dealers, slaughterers, tanners, wool-sorters, laborers in felt factories, etc.,—and it occurs in the great majority of cases in male adults. It is most common in those countries in which the corresponding disease in cattle occurs most frequently, namely, Russia, France, and Germany. It is not often seen in this country; probably not more than two or three cases occur annually in New York city.

Diagnosis.—The diagnosis of a typical case of anthrax carbuncle offers little difficulty. In its earliest stages there is no possibility of distinguishing it from furuncle, carbuncle, or phlegmon. It is unmistakable, however, as soon as the central depressed eschar with its border of vesicles has formed. This appearance is absolutely pathognomonic. Diffuse œdema, which sometimes follows the inoculation, may be mistaken for phlegmon or malignant œdema. The tendency to suppuration in phlegmon serves to differentiate that disease; rapid disintegration and liquefaction characterize the necrosis in malignant œdema. In all cases the aid of the microscope should be invoked. The characteristic bacillus is readily found in the affected tissue juices.

Prognosis.—Internal or systemic anthrax is almost always fatal. The issue in local or cutaneous anthrax depends on the treatment. Left to itself, or inadequately treated, general infection, with death, almost invariably occurs. But when an early diagnosis is made and energetic rational treatment instituted, the prognosis, while always doubtful, is not so grave; about seventy per cent of the patients recover. The prognosis is less hopeful when the inoculation is followed by anthrax œdema, owing to the difficulty of carrying out radical measures of treatment and the greater likelihood of the development of systemic infection.

Treatment.—The most radical and thorough antiseptis, instituted at the earliest possible moment, is the only rational treatment. The infected region should be excised, the line of incision lying well without the zone of infiltration. The operation should be performed under a strong antiseptic stream from an irrigator, to avoid reinfection of the cut surfaces. To this end, too, the cavity should be mopped with a one-per-cent sublimate solution or other strong antiseptic. The wound should be covered with a wet dressing of 1 to 1,000 sublimate solution. A less radical method of treatment consists in parenchymatous injections of 1 to 100 sublimate or

five-per-cent carbolic. The needle of the hypodermic syringe is passed at half a dozen points from the border of the infiltration toward the center of the patch, and the injection made as the needle is withdrawn. The series of injections may be repeated every four or five hours until the spread of the local process is checked, or until symptoms of carbolic or sublimate poisoning develop. In anthrax œdema, free, deep incisions should be made over the entire affected region, strong antiseptics mopped freely into the wounds, and the most thorough system of antiseptic irrigation carried out. Parenchymatous injections of an antiseptic may be made in the center and at the border of the œdema. An ice-bag may be applied over the affected region. Internally, the exhibition of the sulphite or of the hyposulphite of soda has been recommended. Tonics and stimulants may be required, and alcohol in large doses should be given if symptoms of general infection develop.

EQUINIA. (S. POLLITZER.)

Synonyms: Malleus; Glanders; Farcy; Ger., Rotzkrankheit; Fr., Morve; Farcin.

Definition.—A contagious disease with constitutional symptoms and lesions of the skin and mucous membrane, due to infection with a specific virus containing the *Bacillus mallei* derived from the horse, the ass, or the mule.

Before the discovery of the specific germ of equinia, two forms of the disease, glanders and farcy, were regarded as distinct diseases. When the nasal mucous membrane was the chief seat of the disease it was called *glanders* (*malleus humidus*); when the lesions were located chiefly in the skin it was called *farcy*.

Symptomatology.—The disease runs either an acute or a chronic course. Inoculation may occur through any lesion of the skin, or through the unbroken mucous membrane of the eye, the nose, or the respiratory tract. Following infection there is an incubation period of a few days, or possibly two or three weeks; in inoculation experiments on animals the incubation period is three to five days. Then follow vague symptoms of general *malaise*, more or less fever, sometimes a chill or rigor, and pains in the limbs, so that the case is often mistaken for acute rheumatism. At the point of inoculation the wound may heal and break open again after a few days, or from the start a hot, red, inflammatory papule or a pustule on a livid red base may develop, which soon breaks down into an ill-conditioned, spreading ulcer, with ragged, undermined borders. Lymphangitis and swelling of the glands soon develop. Very rarely a diffuse, phlegmonous inflammation takes the place of the primary nodule.

If the inoculation has occurred on a mucous membrane, progressive

ulceration slowly destroys the soft parts and may affect the bones; the entire region, generally the face, is swollen and œdematous. As the disease continues nodules spring up under the epidermis, resembling the vesico-pustules of smallpox, but without umbilication. They appear, irrespective of the point of infection, within a few days after the occurrence of the first symptoms, or their development may be delayed for several weeks. These nodules soon break down into offensive, spreading ulcers. They develop almost anywhere on the skin, but are most common on the forehead and the extremities. Larger and more deeply situated nodules, from a hazelnut to a walnut in size, located in the muscles and in the lymph glands, also develop, and thickened, inflamed lymphatics may connect these nodules. These lymphatic nodules in the horse are called **farcy buds**. The nasal mucous membrane becomes affected in the majority of cases, and as a rule the lesions develop there within the first two or three weeks, though they may not occur till quite late in the course of the disease. An early examination will show one or more grayish, gelatinous nodules from a barley to a pea in size, situated on the septum or over the turbinated bones. They may be isolated or in groups. They tend to break down very soon, leaving ulcers which spread and may lead to perforation. The discharge from the nose is at first catarrhal, later muco-purulent. Nose symptoms are less common in the chronic than in the acute cases. Other mucous membranes—the eye, mouth, throat, respiratory and digestive tract—may also become affected, and if the skin lesions are absent, the case with its fever, prostration, and diarrhœa, may simulate typhoid. In acute cases the fever becomes more intense, and symptoms of sepsis develop, followed by delirium, coma, and death.

In the chronic cases the number of local manifestations is limited, they are of slower development, and the constitutional disturbance is less severe. Ultimately the ulcers begin to cicatrize, and the patient gradually gets well, but is always more or less crippled by the cicatrices, which are sometimes very extensive. The average duration in the chronic cases is four to six months. Sometimes in the course of a chronic case the symptoms become suddenly acute and the patient dies in a few days; just as a miliary tuberculosis may develop in the course of a chronic tubercular affection. Hallopeau and Jeanselme (*Ann. de Dermat.*, 1893) have recently published an instructive case in which the patient died of acute equinia, after suffering for six years with the chronic form.

Anatomy and Pathology.—The local changes in equinia are histologically alike in the acute and chronic forms. The nodule consists of a dense accumulation of embryonic (round) cells at a focus in the lower dermal region. The vesico-pustules have been compared in appearance to those in variola; they differ, however, microscopically, in that the rete cells are not driven apart into a network as in smallpox, but the entire epidermis

is raised, thinned, and finally ruptured. The microscopic appearances are not unlike those in tuberculosis, especially in the chronic form, where the ulcers are of long duration; though giant cells are seldom seen. The bacilli are abundant in the tissues, though in less numbers than in the lesions of anthrax. The path of the infection is along the lymphatics, and it happens sometimes that the germs find their way into blood-vessels, and then bacillary emboli may be rapidly carried throughout the system. The specific lesions—accumulations of round cells and bacilli—occur, besides in the skin and mucous membrane, in the muscles (in man) and the viscera; the bones and joints are generally affected by secondary extension. The lesions characteristic of pyæmia may also be present.

Etiology.—Equinia in man is always derived by contact with the virus of the disease in horses and their congeners. It is limited, therefore, almost exclusively to those whose occupation brings them in close contact with horses—stablemen, jockeys, cavalrymen, and veterinary surgeons. A few cases of transmission from man to man have been noted. The specific organism of the disease, the *bacillus mallei*, was discovered by Loeffler and Schütz, in 1884. It is somewhat shorter and broader than the tubercle bacillus, straight or gently curved, with slightly tapering, rounded ends. The germs retain their vitality for many months when dried, but they are readily killed by our ordinary antiseptics; ten minutes' exposure to a temperature of 135° Fahr. destroys them. Inoculation of pure cultures in animals produces the disease. Infection takes place with fresh virus from a sore or some abrasion of the skin, or particles of infected muco-pus from the nasal cavity may be thrown on to the conjunctiva by snorting horses; or the disease may be acquired through the inhalation of dried germs with the dust of stables in which diseased animals are kept. It has been experimentally demonstrated that virus rubbed into the skin may infect an animal through the hair-follicles. It would appear that man is not especially susceptible to the disease, for only a very small proportion of those exposed acquire it. The disease is fortunately very rare.

Diagnosis.—A fully developed typical case of equinia can hardly fail of recognition. The pyrexia, the nasal symptoms, and the skin lesions form together an unmistakable picture. Until the characteristic lesions develop, however, the disease may be mistaken for articular rheumatism or for typhoid. A history of contact with horses may aid in clearing the diagnosis. In the chronic form of the disease the skin lesions may resemble those of syphilis or of tuberculosis. A consideration of all the symptoms, however, should enable the physician to make a diagnosis. The results of inoculation experiments on animals will remove all doubt as to the nature of the case. The specific bacillus may be found in the discharges, and is readily stained by methylene blue.

Prognosis.—A fatal issue is invariable in the acute form of equinia. When the tendency of the disease is toward chronicity the prognosis is better. The greater the duration of the disease the better the patient's chances of recovery, providing he can resist the exhausting effects of the persistent ulcerations. About fifty per cent of the patients recover in the chronic form.

Treatment.—The local manifestations of the disease should be subjected to the most thorough antiseptics. Radical measures are the best: every ulcer and every nodule should be extirpated or thoroughly cauterized with the Paquelin and dressed antiseptically. General treatment should be aimed at supporting the patient. Stimulants, nutrients, and tonics must be lavishly exhibited.

Prophylaxis consists in the thorough disinfection and destruction of the carcasses of infected animals, which should be killed as soon as a diagnosis is made. A suspected point of inoculation should be thoroughly cauterized and disinfected. An infected surface, like the conjunctiva, should be treated by long-continued antiseptic irrigation.

DISSECTION WOUNDS. (S. POLLITZER.)

Dissection wounds belong to the general class of poisoned wounds. As the name implies, the virus is obtained from a dead body during a dissection, or more commonly at a post-mortem examination, and the point of inoculation may be a cut or any accidental abrasion of the skin. The nature of the infection depends, of course, in large measure on the cause of death of the dissected body; thus, a wound infected with virus from a patient dead of anthrax or of equinia may be the starting point of these diseases respectively in the individual infected. As all the diseases of known bacterial origin which interest the dermatologist are considered elsewhere in this work, we need not here discuss any but those local forms of infection of which the origin is unknown, or which offer some local peculiarity. Bodies of those dead from some septic process like puerperal fever develop lesions of peculiar virulence. These affect chiefly the areolar tissue and the lymphatics. The local symptoms in these cases resemble diffuse phlegmon, and there may be lymphangitis, lymphadenitis, phlebitis, septicæmia, and pyæmia. Sometimes a rapidly fatal septicæmia may develop almost without any local signs. Sometimes the infection manifests itself first in distant lymphatic glands, like the axillary. These forms concern rather the general surgeon than the dermatologist. Only two forms of the results of dissection wounds, the *post-mortem pustule* and the *post-mortem tubercle*, can be considered in a work on diseases of the skin. Of course, opportunities for infection with ordinary pus cocci

are frequent, and manifest themselves as boils, whitlows, paronychia, and folliculitis on the back of the hand. These affections present nothing characteristic, and their treatment does not differ from that of similar affections occurring under other conditions.

Post-Mortem Pustule.—This starts from some insignificant lesion of the skin, which soon after the inoculation becomes red, feels hot, and itches. Within forty-eight hours a small, painful, and tender pustule is formed; the subjective symptoms are relieved by opening the pustule, but a crust soon forms, pus gathers under it, and the symptoms return. This process is repeated each time the crust is removed, and the little ulcer gets larger each time. Sometimes there is involvement of the glands and lymphatics, and slight constitutional disturbance. The ulcer most resembles a soft chancre, but the history of the case generally obviates any possibility of confusion.

The treatment consists in removing the scab, dusting the ulcerated surface with aristol or iodoform, and applying a wet, mildly antiseptic compress until the ulcer heals.

Post-Mortem Tubercle (*Verruca Necrogenica*; Post-Mortem Wart; Anatomical Tubercle; *Tuberculosis Verrucosa Cutis*), which is a tuberculosis of the skin intermediate between lupus and tubercular ulceration, will be fully treated of in another portion of this work, under its appropriate heading.

IMPETIGO. (H. W. STELWAGON.)

Synonyms: Impetigo Simplex; Impetigo Sparsa (Bateman, Wilson, Hillairet).

Definition.—Impetigo is an acute inflammatory disease of the skin, characterized by the formation of a number of pea to finger-nail-sized, hemispherical, usually firm, discrete pustules.

In olden times this term was applied to various pustular inflammations of the skin, more especially those of an eczematous character. At the present day the existence of a special disease of the nature here described is almost universally doubted. Duhring maintains, however, that a distinct affection entitled to this name does exist, and has reported cases to substantiate this claim. I have met with a limited number of cases similar or closely analogous to those referred to by this writer, but a large experience in impetigo contagiosa in recent years has tended to convince me that such cases are in all probability anomalous examples of this latter disease.

Symptomatology.—The affection is sometimes preceded by symptoms of slight systemic disturbance of an evanescent character, such as *malaise*, loss of appetite, and constipation. The eruption consists usually

of from three to twenty or thirty pustules, of size varying from a small pea to a small cherry, appearing more especially over such parts as the face, hands, fingers, lower extremities, and feet. They begin as true pustules with apparently no prevesicular stage; appear, as a rule, rapidly, maturing in a few days. Instead of coming out in distinct crops, it is not uncommon for the lesions to make their appearance one after another for a week or so. In their early stages they are usually surrounded by an inflammatory areola which may be slight or pronounced, and which disappears in part or entirely when the pustules have reached maturity. There is, however, as a rule, no positive infiltration or induration of the base. They are whitish or yellowish in color, markedly elevated, well distended and tense; in shape semiglobular, with thick and tough walls. They show no tendency to coalesce, even when several are closely contiguous, nor do they exhibit any disposition to spontaneous rupture or to become umbilicated. Attaining their full size, they may so remain one or two days, their contents at times becoming slightly bloody; they then gradually, in the course of several days or a week, dry to yellowish or brownish crusts, which soon drop off, leaving no permanent trace. If accidentally ruptured when maturing or matured they pour out a thin, puriform liquid; if the rupture consists of but a slight prick or break, it may close by the drying of the exuding pus, and the lesion refill.

The amount of crusting varies. In some lesions the contents are partly or almost wholly absorbed, and the resulting crust is thin and insignificant, while in others lacking such tendency the crust may be quite thick. The crusts remain adherent for one to several days, then loosen and drop off. The site is marked by a reddish spot, which, however, soon fades away. The process is not destructive, and there is, therefore, never any tendency to scar formation. As to subjective symptoms, there may be slight soreness, but rarely any marked itching or burning. The course of the disease is acute, lasting ten days to a few weeks.

The following two cases Duhring has reported as typical examples of the disease (*American Journal of the Medical Sciences*, October, 1888):

CASE 1.—A boy of four years, well nourished, stout and hearty-looking child. The mother states that he has always heretofore enjoyed excellent health, and that this is the first disease of the skin he has ever shown. It began two weeks ago with slight itching, which was soon followed by "whitish lumps, like hives." Shortly after this, yellowish-white lesions—pustules—appeared, a few at a time, "lasting several days, and drying up." They formed rapidly, from three to five days sufficing to arrive at maturity. There were slight feverish symptoms in the beginning, but not any since, although the child is still restless and scratches himself at night. The bowels are somewhat constipated, but the appetite remains good.

At the present time there exist about two dozen lesions, situated mostly upon the fingers, toes, and legs. They are typical pustules, and vary in size

from small to large split peas. In form they are uniformly semiglobular or dome-shaped, and are raised about a line above the surrounding healthy skin. In no instance are they either acuminate or umbilicated. They are firm, have thick walls, and are tensely distended. In passing the hand over the surface they can be readily detected as firm, distinctly defined elevations. They are mostly of a pale sulphur-yellow or straw color, but in some instances are whitish-yellow, and are seated upon extensive, bright-reddish, highly inflammatory, non-indurated bases. They are, moreover, discrete, and manifest no tendency either to aggregate or to group. The regions involved are the neck, arms, hands, hips, thighs, legs, and feet. The face and scalp remain free. There is one large and conspicuous lesion on the dorsum of the foot.

The case was seen on several occasions subsequently, the lesions each time showing signs of rapid involution. Crusts—somewhat friable, yellowish in color—formed, and in the course of a few days dropped off, leaving a circumscribed reddened surface or spot, which in a short time disappeared. The process showed itself to be benign and superficial in character, and ran its course in from two to three weeks. No treatment, either local or internal, was employed.

CASE 2.—The second case is that of a boy, likewise four years of age, stout, ruddy, and healthy-looking, who was brought to me with a disseminated, discrete, distinctly pustular eruption, which had appeared seven days before. The mother stated that the child was in good general health, and that digestion and the bowels were in proper order. The skin disease had manifested itself first about the face, then about the hands. At present it consists of twenty or thirty disseminated, some few acuminate, but mostly semiglobular, small, pea-sized, inflammatory pustules, with slight areolæ. They are yellowish, opaque, and, for the most part, without signs of crust. The older lesions are whitish, with only faintly marked areolæ, and are sharply defined and conspicuous. They occur about the eyebrows, eyelids, bridge and side of the nose, and over the temples; also on both hands, including the fingers, which are swollen, and it is here that the disease shows itself most markedly. The backs of the hands, palms, and fingers are studded with numerous discrete lesions, pea and bean sized, circumscribed and semiglobular, and are surrounded with defined areolæ. In form they are rounded or ovoidal, and they are distinctly pustular, being opaque and of a whitish-yellow color. They are elevated about a line above the surrounding healthy skin, and are for the most part tensely distended, firm to the touch, have thick walls, show no tendency to rupture, and at a distance resemble in appearance small, whitish, sugar “mint-drops” stuck on the skin. There is no itching, but the hands feel sore.

The child was seen on several occasions during the following week, and but few new lesions appeared. The older ones became larger, whiter, and dried into rather friable, yellowish crusts, while some few became flaccid, and through contact had been ruptured, discharging contents streaked with blood. . . . The treatment had from the beginning been expectant, and the disease pursued a course ending in spontaneous cure in from two to three weeks.

Pathology and Morbid Anatomy.—The lesions are well-defined, circumscribed pustules, beginning and continuing as such throughout their course; they arise abruptly from the skin, having but a slight, insignificant base, which is never of a highly infiltrated or indurated char-

acter. The walls are thick, consisting doubtless of the entire epidermis including the mucous layer, the disease having its chief seat in the papillary layer of the corium. Microscopically, the contents of the lesions are found to be composed of pus-corpuscles, pus cocci, a few red blood-corpuscles, epithelial cells, and cellular *débris*. According to Robinson, these embryonic or pus corpuscles have their origin from the circulation and from the tissue of the inflamed region.

Etiology.—Impetigo is essentially a disease of early childhood, being most common between the ages of three and twelve. Occurring in adults, as is sometimes observed, the lesions are commonly seated upon the hands and fingers. It is a rare disease, and, according to Duhring, is not contagious. This same writer states also that there are no known predisposing conditions, the subjects of the disease being usually in good health. On the other hand, Robinson has met with it among the uncleanly and improperly fed, frequently associated with acid dyspepsia or other digestive disturbance. My own observations would indicate that it may occur indiscriminately among those in good or bad health. It may, I think, be accepted as certain that sooner or later the direct cause for the disease will be found to be a micro-organism.

Diagnosis.—Impetigo is to be differentiated from impetigo contagiosa, ecthyma, and pustular eczema. It differs from the average cases of impetigo contagiosa in several particulars. The lesions of impetigo are pustules from the very start, are elevated, rounded, thick-walled, and therefore somewhat deep-seated, with no tendency to form patches by coalescence, and drying to thickish crusts; on the other hand, the lesions of impetigo contagiosa begin as vesico-papules, vesicles, or vesico-pustules, tend to increase rapidly in size, are thin-walled and superficial, flattened, with, as a rule, more or less umbilication, exhibit a disposition to coalesce and dry to thin, yellowish, wafer-like crusts.

Ecthyma pustules are deeper-seated, larger, flat, with a markedly inflammatory, hard, and often extensive base and areola, drying to thick brownish or blackish crusts, beneath which are deep excoriations; impetigo pustules are elevated, rounded, with but a slight areola, and never markedly infiltrated or indurated base, and exhibit beneath the crusts merely superficial abrasion. Ecthyma is, moreover, commonly seen in adults, in those who are in a depraved state of health; the subjects of impetigo, on the contrary, are usually children, who otherwise seem to be in good condition.

Pustular eczema can scarcely be confounded with impetigo; the pustules of eczema are small in size, usually pinpoint to pinhead, closely aggregated, tend to become confluent, are usually to be found associated with papular and vesicular lesions, and with more or less inflammation and thickening of the involved areas. Moreover, eczema is decidedly

itchy, whereas the subjective symptoms in impetigo rarely consist of more than slight soreness.

Prognosis.—The prognosis of impetigo is favorable, the disease tending to rapid and spontaneous disappearance, rarely lasting more than ten days to several weeks.

Treatment.—The disease will take care of itself without treatment, but certain measures have an influence toward shortening the process and possibly toward the prevention of new lesions. Each pustule should be pricked or incised and the contents pressed out, and a simple protective dressing of carbolyzed oxide-of-zinc ointment, five to ten grains to the ounce, freshly applied twice in the twenty-four hours; in sluggish lesions, ammoniated mercury, ten to twenty grains to the ounce, may be added to the above ointment. As a precautionary measure in the prevention of new lesions, a saturated lotion of boric acid, with five to ten grains of resorcin or carbolic acid to the ounce, may be applied to the affected region generally. The treatment is indeed essentially that of impetigo contagiosa.

IMPETIGO CONTAGIOSA. (H. W. STELWAGON.)

Synonyms: *Porrigio Contagiosa*; *Impetigo Parasitica*.

Definition.—Impetigo contagiosa is an acute, contagious, inflammatory disease of the skin, characterized by the formation of discrete, superficial, flattened, rounded, or oval vesicles or blebs, soon becoming vesico-pustular, and drying to thin yellowish crusts.

Symptomatology.—In a typical case of impetigo contagiosa several vesico-papules, vesicles, or vesico-pustules make their appearance simultaneously or in rapid succession upon the face, face and scalp, or face and fingers, or upon all these various parts. At first small, they tend to increase in size, becoming decidedly flattened, with, in many lesions, a sinking in of the central portion; there may even be distinct umbilication. They are superficial, and, as a rule, are without conspicuous areolæ. They usually attain the diameter of a pea or a dime, and when close together, as often noted when about the mouth and chin, coalesce and form one or more large, irregular patches. The contents at first are purely vesicular, later becoming milky or sero-purulent or even purulent. If a vesico-pustule or bleb is broken, a reddish, moist, abraded-looking surface is exposed, secreting a thin, puriform liquid. Several days after the appearance of the lesions they begin to dry to thin, granular, yellow or yellowish, waferlike crusts, which are but slightly adherent, and later on, when the edges have commenced to loosen, have the appearance of being imperfectly pasted on. Fresh lesions may appear singly or in crops from day to day, but finally, in the course of several days or a week, new

ones cease to form and the disease gradually ends. The crusts soon drop off, leaving behind reddish spots which rapidly fade away. Itching may or may not be present. The whole course of the disease has occupied ten days or a few weeks.

Exceptionally, in addition to the eruption upon the skin, a few lesions show themselves upon the conjunctival, nasal, or oral mucous membrane. A not unusual site for a lesion is around a finger nail, appearing like a superficial paronychia. Excoriations, scratch-marks, or abrasions, if present, soon become, through auto-inoculation, the seat of characteristic lesions. As a rule there is no constitutional disturbance, but when the eruption is extensive, as it is more apt to be in the epidemic form of the disease, it is preceded by light febrile action and *malaise*.

In other cases of the disease the eruption consists of but two, three, or several lesions about the nose and mouth, with possibly one or two upon the fingers. In others, again, instead of being confined to the face and hands, the eruption is more or less scattered, appearing as widely discrete lesions over face, hands, limbs, and to a less extent upon the trunk, consisting in all of twenty to forty or more lesions. Ordinarily these go through the same stages already described, appearing as small vesicles or vesico-pustules, gradually increasing to a pea or dime in size, flattening, and the contents becoming milky, sero-purulent or purulent, and drying to thin crusts. In others somewhat similar to the last named, the lesions, instead of being flat, have a decidedly pemphigoid appearance, consisting of dime to quarter-dollar-sized blebs, flaccid or tense. This last is occasionally observed occurring in an epidemic manner among young infants, simulating pemphigus in appearance. In rare instances, instead of vesicles or blebs, many of the lesions, especially those upon the legs, become ecthymatous with an inflammatory base and areola. In rare instances also the vesicular stage of the disease seems to be wanting, the lesions appearing as pure vesico-pustules or pustules, with little or no tendency to flattening or umbilication.

In exceptional instances the common site for the eruption may be exempt, the lesions appearing in unusual regions. In one hundred and three cases observed at the Philadelphia Dispensary for Skin Diseases the site was as follows :

	Cases.		Cases.
Face.....	49	Legs.....	3
Face and hands.....	12	Trunk and legs.....	2
Face and limbs.....	6	Trunk and limbs.....	1
Face and scalp.....	5	Hands and neck.....	1
Face, scalp, and hands.....	5	Hands and buttocks.....	1
Face, hands, and other parts....	4	Scalp.....	1
Face and trunk.....	3	Buttock.....	1
Face and buttock.....	3	Limbs.....	1
Face and feet.....	1	Distribution more or less general	4

Pathology.—Various opinions are held as to the true nature of the disease, although it may be said that the consensus of opinion seems to be approaching the belief that it is due to a micro-organism. It would certainly seem, in the light of our present knowledge and investigations, that pus cocci, possibly a specific or even the common pus variety, may be responsible for this eruption. In some instances, those in which the eruption is epidemic and more or less general in its distribution, with slight constitutional disturbance, the disease certainly bears resemblance to such eruptive fevers as varicella; and it is difficult, it is true, to reconcile such cases with the numerous simple cases of undoubted pus inoculation lesions occurring about the nose, mouth, and hands.

Etiology.—The disease is contagious, the contents of the lesions being inoculable and auto-inoculable. From its occurring in epidemic form it would almost seem as though the disease might be infectious. It is a disease of the lower ranks of life, although it is not infrequently seen among the wealthier classes. It is essentially a disease of infancy and early childhood, being most common between the ages of two and ten; occurring in adults, the eruption is usually abortive, consisting of two, three, or more ill-developed lesions, which, as a rule, are of short duration. A relationship to vaccination has been noted in some instances; but the same relationship may be said to exist, I believe, to other suppurative processes or lesions occurring in children. For instance, it is also stated to be caused by pediculi; but these cases are only another example of pus inoculation, the pustular inflammation excited by the pediculi furnishing the pus for the production of impetigo contagiosa lesions, the same as the vaccine pustule supplies it for those cases said to be associated with that operation.

Diagnosis.—Impetigo contagiosa is to be differentiated from pustular eczema, impetigo, ecthyma, varicella, and pemphigus. The patches formed by coalescence bear, it is true, a rough resemblance to pustular eczema; but this latter is accompanied with other symptoms of eczema, such as more or less infiltration and thickening of the involved skin, with intense itching. Moreover, in impetigo contagiosa discrete lesions are always to be found, and these differ from the individual pustules of eczema in greater size, in the absence of a tendency to rupture, and their course.

Impetigo contagiosa differs from impetigo in that the lesions of this latter disease are pustules from the very beginning, are elevated, rounded, with absence of tendency to flatten or to become umbilicated, with no disposition to form patches by coalescence, and dry to thicker crusts. In rare instances of impetigo contagiosa mentioned, in describing the symptoms, the pustules are similar to those of impetigo, and it is difficult to distinguish one form from the other; these cases, in fact, lead one strongly

to the belief that the two processes are in reality one, some unknown individual peculiarity making up for the usual clinical differences.

Impetigo contagiosa differs from ecthyma by the absence of the inflammatory base and areola. The distribution is also unlike the eruption in the latter disease, being ordinarily upon the face and hands, or face and several other parts, while that of ecthyma is usually seated upon the legs. Moreover, impetigo contagiosa is essentially a disease of childhood, whereas ecthyma is a disease of adult life. In the former, too, the disease is superficial ; in the latter, deep-seated.

The lesions of varicella are uniform and smaller, rarely larger than split peas, and more or less disseminated, with no tendency to patch formation and with insignificant crusting. In those rare cases of impetigo contagiosa resembling pemphigus the disease must be studied in its entirety, and sometimes for several days before it is possible to be positive in diagnosis. Pemphigus is exceedingly rare under all circumstances, and especially so in infants and young children. In true pemphigus the lesions spring from the sound skin usually as blebs of some size from the start, whereas in impetigo contagiosa the lesions are small in the beginning and grow in size by peripheral extension. The eruption of pemphigus has no parts of predilection, and, moreover, is usually accompanied by symptoms of grave constitutional disturbance.

Prognosis.—Impetigo contagiosa tends to spontaneous disappearance in ten days to a few weeks ; but in exceptional cases, more especially in those cases in which itching is present to a sufficient degree as to lead to scratching, the excoriations thus made become inoculated, and in this manner the disease may persist for one or two months. The effect of treatment is, however, in all cases prompt.

Treatment.—While this disease usually runs a self-ending course, treatment should be instituted as early as possible, in order to destroy the inoculable properties of the lesions, and thus hasten the cure. Each case rapidly cured is one less center for its spread to others. The crusts should be removed by warm water and soap washing, preceded, if necessary, by an unguent or oil application. An ointment of ten to twenty grains of ammoniated mercury to the ounce should then be gently but thoroughly rubbed into the secreting base of the lesions two or three times daily. When the crusts are quite adherent, and fail to come off with ordinary washing, the salve just named should be applied over the patch, and the washing and such anointing repeated twice daily till the crusts come away, after which the ointment should be rubbed into the secreting base. In many of these latter cases, indeed, partial or complete healing will be found to have taken place beneath the crusting. An ointment containing ten to twenty grains of resorcin, one containing a half drachm of boric acid to the ounce, and one of ten to thirty grains of

precipitated sulphur to the ounce, will also prove equally efficacious. In fact, any mildly stimulating antiseptic ointment will have a like favorable effect.

In markedly itchy cases, in which the disease tends to continue from inoculation of the excoriations thus provoked, a lotion of the saturated solution of boric acid, with five grains of either carbolic acid or resorcin, or both, and five to ten minims of glycerin and alcohol to each ounce, should be applied two or three times daily to the affected parts generally. For lesions occurring on the conjunctiva, a plain boric-acid lotion, ten grains to the ounce, may be dropped in the eye once or twice daily.

ECTHYMA. (H. W. STELWAGON.)

Definition.—Ecthyma is a disease characterized by the appearance of one or several discrete, finger-nail-sized, flat, usually markedly inflammatory pustules.

Symptomatology.—The lesions begin as small, usually pea-sized pustules, without a prepapular or prevesicular stage. They increase somewhat in size, and when fully matured attain the area of a dime or quarter-dollar. They are flat, and have a markedly inflammatory base and areola, with usually considerable infiltration and induration of the underlying tissue. In color they are at first yellowish, but soon become, from the admixture of blood, reddish or brownish. They gradually, in the course of several days to several weeks, dry to brownish or blackish crusts, beneath which will be found, in the earlier stages of this process, superficial excoriation. If a maturing pustule is pricked or accidentally ruptured, the fracture may close by drying of the exuded pus and the lesion fill up again. The individual pustules are usually somewhat acute in their course, lasting ten days to a few weeks; but new lesions may continue to appear from day to day or week to week for a period of several months. Although it may be met with elsewhere on the surface, the leg is the common site for the eruption, and as a rule not more than five or ten lesions are present at any one time. More or less pigmentation, and in rare instances superficial scarring, may remain to mark the site of the pustules. The pigmentation is extremely slow in disappearing, and in some cases doubtless may be more or less permanent. The subjective symptoms are never marked, and rarely consist of more than slight pain and tenderness. Itching is occasionally complained of, but is never an urgent symptom.

Pathology and Morbid Anatomy.—The process is distinctly a pustular one from the beginning, and one which is accompanied by considerable surrounding and underlying inflammatory infiltration. The

whole thickness of the epiderm and the papillary and upper layers of the corium are probably involved. It rarely invades the deeper skin, so that permanent scarring only exceptionally follows. Pigmentation, which is quite decided, marks the site of the lesion in the white, whereas in the colored race comparative or complete absence of the normal pigment follows the disease.

Etiology.—Ecthyma is distinctly a disease of the lower walks of life, and occurs in those debilitated from any cause whatsoever. It is therefore more commonly seen in poor-houses, prisons, and in the slum districts. Improper food, living under bad hygienic conditions, are predisposing. Its common subject is the adult tramp or the low-class tenement lodger. It rarely occurs in children. The exciting cause of the disease must be considered, from the standpoint of our present knowledge, to be a micro-organism, probably the *staphylococcus albus* or *aureus*. Nor can it be doubted that the slight breaks in the continuity of the cutaneous tissues produced by vermin—the bites of lice and bedbugs—in those whose other conditions and surroundings predispose, are in many cases potential factors in the production of the disease.

Diagnosis.—Ecthyma is to be differentiated from impetigo, impetigo contagiosa, and the large, flat, pustular syphiloderm. It differs from impetigo in the character and size of the lesions, by its markedly inflammatory hard base and areola, and by its commonly occurring in the adult, more especially in those in a depraved state of health; the lesion is, moreover, flat, deeper seated, and usually slow in its course. These same characters (excepting the flatness), and the absence of a tendency to become confluent, its occurrence usually upon the legs and in adults, and its comparative or possibly complete non-contagiousness, will serve to distinguish it from impetigo contagiosa.

The flat pustules of syphilis are ordinarily sluggish, much less inflammatory, and usually lacking the extensive, hard, and bright red base and areola of ecthyma; moreover, the ulceration of the syphilitic lesion is deeper and more sharply cut, and the secretion is thicker, drying to greenish or greenish-brown crusts, which are more bulky and inclined to be heaped up like an oyster shell. The flat pustular syphiloderm is also almost invariably accompanied with other symptoms of syphilis.

Prognosis.—Ecthyma is rapidly amenable to treatment. If let alone, with the same conditions predisposing, the disease may go on for several months, or almost indefinitely.

Treatment.—The essential treatment of ecthyma consists in the removal of the predisposing influences, together with the use of local antiseptic applications. The patient is to be placed under better hygienic conditions, and should have proper and sufficient food. In fact, everything is to be done to improve the tone of the general health. Tonics,

such as iron, nux vomica, quinine, and nutritives such as malt and cod-liver oil, should be advised.

Cleanliness is necessary, and alkaline baths, or frequent baths with the use of the ordinary toilet soap, will be found of great value. Sodium carbonate or sodium bicarbonate may be used for the alkaline bath, two to four ounces of the salt to twenty or thirty gallons of water. Many of the crusts will thus be removed. If they are firmly adherent, water dressings or the constant use of an antiseptic salve, freely applied twice daily, will be found necessary. In fact, such a salve should be used from the very beginning of the treatment. For this purpose an ointment of ammoniated mercury, ten to thirty grains to a half ounce each of oxide-of-zinc ointment and petroleum ointment, to which may be added five or ten grains of salicylic acid, will prove of value. A weak red precipitate ointment, five to thirty grains to the ounce, or a similar ointment of calomel, or an ointment of boric acid a drachm to the ounce, will likewise be found curative. In some cases the crusting remains more or less adherent throughout, healing gradually or rapidly taking place beneath the crust, which finally drops off. If the disease is sluggish, an application of a resorcin lotion, five to twenty grains to the ounce, may be made to the lesions each time the salve is applied. A similar lotion, containing in addition to the resorcin fifteen grains of boric acid and a few minims of glycerin and alcohol to each ounce, or any other mild antiseptic wash, should be applied all over the affected region as having a distinct influence toward preventing the formation of new lesions.

DERMATITIS HERPETIFORMIS. (H. W. STELWAGON.)

Synonyms: Hydroa; Hydroa Herpetiforme; Dermatitis Multiformis (Piffard); Dühring's Disease; Herpes Gestationis; Pemphigus Pruriginosus; Herpes Circinatus Bullosus (Wilson); Pemphigus Circinatus (Rayer); Herpes Phlyctænodes (Gilbert); Pemphigus Aigu Pruriginosus (Chausit); Pemphigus Composé (Devergie); Impetigo Herpetiformis (Hebra); Pemphigus Diutinus Pruriginosus (Hardy); Hydroa Bullosus, Pemphigus Arthritique (Bazin); Dermatite Polymorphe Prurigineuse ou Douloureuse Chronique à Poussées Successives (Brocq).

Definition.—Dermatitis herpetiformis is a somewhat rare inflammatory disease, with or without slight or grave systemic disturbance, characterized by an eruption of an erythematous, papular, vesicular, pustular, bullous, or mixed type, with a decided tendency toward grouping, accompanied usually by intense itching and burning sensations, with more or less consequent pigmentation, and pursuing a persistent, chronic course with exacerbations.

The grouping together by Dühring of the various allied and yet at times dissimilar conditions, under the title of *dermatitis herpetiformis*,

has marked an advance in the study of these puzzling cases. The correctness and value of the observations of this distinguished dermatologist, leading as they did to a unification and clearer comprehension of these heretofore several described diseases, have been gradually winning deserved recognition. At first sight this generalization seemed too broad, but increasing experience corroborates its wisdom. Impetigo herpetiformis was primarily included in this grouping, Hebra's cases, one or two of Duhring's cases, and one reported by Heitzmann, tending to show close relationship. A recent publication of cases by Kaposi, with his expressed understanding of this latter disease, has led Duhring, prematurely I think, to recall provisionally his statement of the identity of this disease with his group, dermatitis herpetiformis.

With the desire to present the subject clearly and fully I have, in addition to basing it upon an observation of about twenty cases of my own, not hesitated, when deemed advisable, to avail myself of Duhring's admirable word descriptions. The valuable analytical study by Brocq has also been of aid, and the various cases reported by other dermatological *confrères* have likewise been assimilated.

Symptomatology.—The onset and the exacerbations are often preceded for a few days by symptoms of general disturbance, such as *malaise*, loss of appetite, constipation, chilliness, flushings and heat sensations, rise of temperature, and often the subjective symptom of itching. During the first several days of the cutaneous outbreak such symptoms may in greater or less degree continue; and in the more severe and extensive types of the disease, especially in the pustular and bullous varieties, the constitutional symptoms may be of a more grave character and more or less persistent. Cases in which the general symptoms give rise to anxiety are, however, it must be said, infrequent. Ordinarily the systemic disturbance is entirely wanting or extremely slight, and the subjects, barring the inconvenience and discomfort caused by the eruption, are, seemingly at least, in a fair condition of health.

The eruption of dermatitis herpetiformis may be erythematous, papular, vesicular, bullous, pustular, or mixed; it is never ulcerative. The type is rarely the same throughout the course of the disease, sometimes changing completely from one to another; in many of the cases, however, taking the entire course of the disease as a whole, there is a preponderant tendency to a certain type. The disease is at times quiescent, the patient being entirely free of manifestations; as a rule, however, while there are remissions in the violence and extent of the cutaneous phenomena of shorter or longer duration, the disease is more or less continuous. The onset of the outbreak may be sudden, or it may be preceded for several days or weeks by slight cutaneous irritation such as itching, one or several insignificant erythematous patches, groups of vesi-

cles or urticarial lesions. When fully developed the eruption may cover almost the entire surface; or it may be more or less limited in extent, involving a greater part or the entire trunk; or the trunk may be but slightly invaded, and the limbs, especially the legs, bear the brunt. It is, in short, in every way, both as regards violence and extent, variable—slight or severe, limited or extensive. Itching is usually a constant and a most troublesome feature; pigmentation sooner or later is, in most cases, also an attendant symptom. After several days or weeks of violent activity the disease tends to become, slowly or rapidly, less active, and a period of comparative comfort and freedom of uncertain duration is passed. These remissions or intermissions, as the case may be, are irregular and capricious; in some cases scarcely one violent outbreak is in full development when another equally active and extensive follows, and this may continue in rapid succession for several months or longer before a period of comparative or complete quiescence intervenes; in such cases, the integument may become somewhat thickened and eczematous in appearance. On the other hand, in some instances after an acute outbreak of several weeks' duration, during which time new lesions have continued irregularly and in lesser number to make their appearance from time to time, the disease rapidly abates, and the patient may remain free, or almost free, for a few weeks, months, or even a year or more.

The vesicles, pustules, and blebs, especially the vesicles and blebs, are somewhat peculiar; they are, many of them at least, usually of a strikingly irregular outline, oblong, stellate, quadrate, semilunar, or rarely ring-shaped, distended or flaccid, and when drying are apt to have a puckered appearance. They are herpetic, in that they show little disposition to spontaneous rupture; occur mostly in groups of two, three, or more, and not infrequently are seated upon erythematous or inflammatory skin; in many respects, indeed, similar to the groups of simple herpes and of herpes zoster. These lesions may disappear by absorption, or, if ruptured or broken, leave abrasions which may secrete for a short time and dry up; or they may dry to crusts which fall off, the sites being marked by erythematous spots, which in turn fade or leave behind slight pigmentation. In size the vesicles are rarely smaller than a pinhead, and are usually the size of small peas. The blebs may be almost any size from a pea to a hen's egg, and may arise as a single lesion from sound or erythematous or erythemato-papular skin, or may have their origin in the confluence of several closely contiguous vesicles or small blebs. The pustules may be ecthymatous, but more commonly are small in size, resembling in this respect vesicular lesions; they often begin as pustules, or may have their origin in vesicles. The mucous membrane of the mouth, throat, nose, and eyes is in some instances—more especially the

bullous cases—involved, and in exceptional cases the mucous membrane of the trachea and the larger bronchial tubes also.

The *erythematous type* of dermatitis herpetiformis manifests itself by an outbreak of bright red, pinkish, becoming later pinkish-yellow, diffuse areas and patches of erythema, maculo-papules, and urticarialike lesions, with at times more or less acute oedematous infiltration. The character of the eruption resembles closely that of erythema multiforme and urticaria, especially the former; at times, indeed, from a mere inspection, without interrogation or knowledge of the history of the case, it appears to be a virtual erythema multiforme, except that there is intense itching. The eruption is usually more or less general in its distribution, consisting of small and large raised plaques melting imperceptibly into the sound skin, or often sharply marginate; not infrequently, also, ringlike erythematopapular patches are scattered here and there; moreover, in some patches, especially the ringlike patches, beginning or positive vesiculation is noticed. Interspersed will now and then be seen more or less typical wheals and patches of urticaria, or these may occur independently at other times when the skin is otherwise free. The efflorescences usually make their appearance in crops, and are more or less persistent; fading sooner or later, however, and giving place to new outbreaks. In extensive cases slight systemic disturbance—showing itself as *malaise*, chilliness, loss of appetite, and mild febrile action—precedes and may, for a time at least, accompany the eruption. The disease may continue in this type indefinitely, with short or long remissions, or it may change to the multiform or other variety. On the other hand, it may itself have been preceded by another type, such as the bullous, vesicular, or multiform.

The *papular type* of dermatitis herpetiformis is uncommon, and is rarely seen consisting purely of papular lesions, but is usually associated with the erythematous and vesicular varieties. The eruption is apt to be scanty, especially in comparison with the other types of the disease. The degree of inflammatory action is acute or subacute. The lesions are seen to be large or small papules, sometimes flat and irregular, resembling hypertrophic eczema papules and the papular manifestations of erythema multiforme, with a distinct disposition toward group formation. Not infrequently a patch of papules bears resemblance to abortive herpes zoster, in which true vesiculation had not been reached. The lesions are somewhat slow in their evolution and course, and in disappearing may leave behind pigmentation, somewhat similar to that following lichen planus papules. Itching is intense, and as a result many of the papules are excoriated and covered with blood-crusts, as in urticaria papulosa; or exceptionally they are covered with a thin film of exfoliating epidermis.

While many of the papules remain such throughout their course, on

the other hand many tend sooner or later to develop into vesicles, new papular outbreaks occurring from time to time. After several weeks or months the disease may abate and the patient enjoy comparative or complete freedom for a shorter or longer period. As a rule, frequent relapses occur; or the whole eruption changes to the vesicular or other type of the disease.

The *vesicular type* of dermatitis herpetiformis is the most common clinical manifestation of the disease, and is characterized by pinhead to pea-sized, rounded or irregularly shaped, distended or flattened, and stellate vesicles, occurring for the most part in irregular and segmented groups of two, three, or more lesions. They may be seated upon normal integument or upon hyperæmic or inflammatory skin, and in appearance are translucent, glistening, pale-yellowish, amber-colored, or pearly. The lesions are usually slow in their development, often requiring several days or a week for completion; and when minute, as they always are in their early stage, many may, from the fact of their translucency and being nearly the color of the healthy skin, be readily overlooked. As a rule, they are without areola, and are usually firm and distended. They exhibit no tendency to spontaneous rupture, but after remaining a shorter or longer time, if they have not been broken by scratching or accidentally, they disappear by absorption, or partly by absorption and desiccation. Closely contiguous lesions tend to coalesce—irregular, stellate, lobulated, and multilocular vesicles or small and large blebs resulting. These confluent lesions, as well as some of the single vesicles or blebs, especially as they are beginning to disappear or dry, have a puckered or withered appearance. The contents of a few lesions become at times milky, sero-purulent, or even purulent. As to distribution, all parts may be invaded, discrete lesions and groups of lesions being seen scattered here and there over trunk, limbs, and face. There is a distinct disposition for the eruption to occur in patches made up of groups and single lesions or of aggregations, upon non-inflamed or inflamed skin; in groups upon inflamed skin the resemblance to patches of herpes zoster is often striking. The eruption may be profuse, scarcely any healthy skin being visible; or, as is more commonly the case, it may be only moderately abundant, large areas of normal integument intervening between the scattered patches of the disease; or the eruption may be more or less limited to one or several regions. The lesions tend to appear in crops, outbreaks often following one another in rapid succession, or at intervals of several weeks or longer; if the former, the involved integument may become more or less thickened, red, and infiltrated. In cases of average development there is no constitutional disturbance; in extensive and extreme outbreaks, especially at the outset, there may be chilliness, febrile action, *malaise*, and similar symptoms. Itching is intense, probably more so than in any other varie-

ty. In some instances the chief subjective symptom is the sensation of burning. Patients seem to obtain partial or complete temporary relief by scratching open or rupturing the vesicles.

The course of the vesicular type of dermatitis herpetiformis is essentially persistent and chronic, with short or long periods—usually the former—of comparative or complete quiescence. Or it may change its phases and develop into the erythematous, pustular, bullous, or multiform type—usually the last named. As a rule, however, the type tends to persist as such.

The following case, which has been under my care for a number of years, is an example of the vesicular type of moderate severity (reported in full in the *Journal of Cutaneous and Genito-Urinary Diseases*, February, 1890):

William H—, aged thirty-two, of English birth, and in fair general health, applied for treatment in 1883. The eruption for which he sought relief, according to his statement, first made its appearance six months previously, and at that time consisted of small solid and vesicular elevations, for the most part occurring in groups, and involving the face, neck, trunk, and limbs. Itching had been a troublesome symptom. At the time of his application the following condition was noted: The face, neck, trunk, and upper parts of the limbs were the seat of a vesico-papular and vesicular eruption, the vesicular character being pronounced. Many of the lesions were discrete, elevated a few lines, and varying in size from a pinhead to a large pea; they were irregularly rounded, angular, or elongate. For the most part, however, the eruption appeared in groups of three or more lesions, the skin intervening between the groups remaining apparently normal. Here and there individual lesions, as they dried, showed slight umbilication. Especially on the breast and upper part of the back was the peculiar grouping of the vesicles to be noticed. In places the vesicles had coalesced, resulting in large, flat, irregularly rounded, quadrate, stellate, or puckered-looking blebs. The vesicles and bullæ, although full, were not distended or tense. In the contents of some lesions could be seen a slight tendency toward milkiness, a few becoming sero-purulent. The same characters, but to a less conspicuous degree, obtained with the eruption on the limbs and face. On the latter, and particularly on the ears, the eruption was more scattered, and although the same disposition to grouping was noticeable, the groups were small, and rarely consisted of more than two or three lesions. In the main the individual lesions, as well as the groups, appeared to arise from apparently healthy skin, but not in all; in some they had their origin from a slightly inflamed base or hyperæmic spot, and this hyperæmic base persisted. These latter groups possessed a close resemblance to the groups of zoster. The covering of the vesicles and blebs appeared thin, but exhibited little, if any, tendency to spontaneous rupture. Many of the lesions had been rubbed or scratched, and in addition to such resulting abrasions and excoriations a few linear scratch-marks could be seen. There was slight pigmentation here and there, showing the site of former eruption. The burning and itching, the patient stated, were at times almost intolerable. The man claimed to know several days in advance of the approach of an outbreak, by a peculiar burning and heated feeling of the skin.

In spite of the cutaneous disturbance and its persistence the general health remained good, although the man was nervous and depressed.

This patient remained under observation for eight years, and during all this time the skin manifestations had persisted with more or less severity ; there were short or long periods of comparative and almost complete freedom, the longest period being nearly two years. The outbreaks were, however, just as severe as in the beginning of the disease, and were, moreover, of the same type. The general health was seemingly good throughout ; there was no organic disease, apparently no cause for the outbreaks, and during the whole period the patient had been engaged uninterruptedly at his occupation.

The *pustular type* of dermatitis herpetiformis is rare. It is somewhat similar in its clinical characters to the vesicular type, except that the lesions are pustular, and somewhat less inclined to irregularity in shape and contour ; and, moreover, the lesions are usually intermingled with papules, vesico-papules, vesicles, vesico-pustules, and blebs. The pustules may arise as such, or may have their origin in pre-existing vesico-papules and vesicles. In size they commonly vary from a pin point to a pea, and are usually acuminate or rounded. In their later course some of the larger pustules may flatten and spread out peripherally, and are surrounded with a slightly or markedly inflammatory areola, with an infiltrated base, having an ecthymatous appearance. There is a decided disposition toward grouping, the groups consisting of two, three, or several lesions, although this tendency is not so marked as in the vesicular variety. Here and there at times the group consists of a central pustule, with an irregular ring of pustules surrounding. Scattered papules, and vesico-papules and blebs, are not infrequently present. The larger pustules complete their development ordinarily in a week or ten days ; sometimes their course is much more rapid. New lesions, singly or in groups, continue to make their appearance in crops or irregularly for several weeks, when the disease may abate for one or more weeks and then break out in full violence again, or be immediately replaced or followed by recurring attacks of varying severity, as in the vesicular type ; or the type may change for a time, to give way, temporarily at least, to the bullous or other variety. In this manner the disease may persist for months and years. Itching is variable as to degree, sometimes intense and at other times slight. In some cases the main subjective symptom is a feeling of intense burning or heat.

The pustular type is a somewhat grave variety of the disease, and the constitutional symptoms of chilliness or chills, *malaise*, febrile action, hot and cold sensations, and general depression, may from time to time present themselves or be more or less continuous. On the other hand, the case may be a fairly severe one, and be entirely lacking any special systemic disturbance. This manifestation is seemingly closely allied to impetigo herpetiformis. Several apparently connecting or midway cases

have already been reported by Hebra, Heitzmann, Duhring, and others, and future observations may possibly place these diseases together in the same class.

The following case, reported by Duhring, illustrates the pustular manifestation (published in full in the *Journal of Cutaneous and Venereal Diseases*, August, 1884):

Annie McC—, American by birth, a brunette, aged twenty-seven, single, and a domestic, had always enjoyed good health. The eruption appeared two or three years previously, since which time it had with some irregularity persisted, assuming, however, during this period, excepting one short interval when it was pustular, the vesicular and bullous types. The present change of type to the pustular occurred a month before coming under observation. The eruption was copious, occupying the greater portion of the trunk and extremities. It consists of numerous, variously sized, rounded, or irregularly shaped pustules in all stages of evolution. They are typical pustules, the smallest of them exhibiting a distinctly pustular state. They vary in size from a pinhead to a large pea, the greater number being of the size of small peas. Where two or more have coalesced, however, small or large finger-nail-sized lesions exist. In shape, when small, they incline to be acuminate, but as they increase in size they become decidedly flat, with an irregularly rounded or angular outline. They incline to crust in the center, and to spread in a creeping manner on the periphery, a ring of small, flat pustules, isolated or confluent, being frequently present; and where two or more are in close proximity they almost invariably run together, forming flat, broad lesions as large as a quarter dollar, and sometimes even larger, the crusting being more or less complete. A bright or deep red areola of considerable size surrounds all the lesions. In color the pustules are whitish and opaque, and contain a thin, puriform, pale-yellowish or whitish fluid. The walls of the young lesions are distended, but those of the older ones are more or less flaccid, and in many instances are ruptured, the fluid oozing forth and drying into flat, uneven crusts of a greenish or brownish color. Here and there are patches of disease, made up not only of confluent lesions, but of two or more distinct groups of lesions.

The distribution of the lesions is, for the most part, in the form of more or less distinct groups, but there are also disseminated lesions. The groups are irregularly formed, and are, as a rule, composed of from two to four pustules. Clusters of two or three lesions situated in close proximity, within an area of an inch in diameter, are not uncommon, while in some places as many as a half dozen or more of various sizes may be found. On the anterior aspect of the middle thigh is a conspicuous group, composed of a central, unbroken, tensely distended, somewhat acuminate, pea-sized, irregularly shaped pustule, with a vivid, deep red puckered areola, around which are three similar but smaller lesions, the whole occupying an area the size of a quarter dollar. In addition to the pustules there are numerous excoriations, blood-crusts, scratch-marks, deeply stained spots with or without old crusts, and general pigmentation of a dirty-yellowish, brownish hue.

The lesions appeared as distinct pustules, usually the size of pinheads, preceded by and accompanied with violent itching. Their areolæ at first are insignificant, but in the course of from twelve to forty-eight hours both areolæ and pustules assume considerable size, the latter flattening out and crusting in

the center, with a somewhat depressed, greenish-yellow, uneven crust. As the crust grows, new, small, flat, frequently indistinctly defined whitish pustules, pinhead in size, appear in the form of an irregular broken ring just beyond the line of the crust. In the case of large lesions this process is observed to repeat itself several times, or, indeed, until the pustule ceases growing. This concentric arrangement of the lesions, while not conspicuous—not as much so, for example, as in herpes iris—is readily noticeable, and is more marked in some lesions than in others. The attack gradually subsided, lasting six or seven weeks, to be replaced in a few weeks or a month by a sharp recurrence of papules, vesicopapules, and vesicles. In this manner the disease varied. A year later the type became purely pustular again, and similar in its character to those here described. No impairment of her general health seemed to exist.

The *bullous type* of dermatitis herpetiformis manifests itself by the sudden or gradual appearance of rounded, irregularly shaped, tense or flaccid blebs. They are often innumerable, may be pea to egg sized, and are usually filled with a serous, milky, or sero-purulent fluid. In shape they resemble the vesicles to a greater or less extent, in that they may be rounded, flattened, quadrate, angular, semilunar, and when drying often have a drawn-up or puckered look. The distribution may be more or less general, in some instances involving almost the entire surface, with a decided tendency toward grouping in clusters of two, three, or more. When several are closely contiguous the intervening skin is usually reddened, inflammatory, and may be puckered. Small, discrete, and grouped vesicles or pustules, or both, may be intermingled, or appear from time to time. The lesions arise from erythematous skin, from pre-existing vesicles or vesicular groups or from apparently normal integument; after several days they are, either by accident or from scratching or rubbing, usually ruptured, and dry to yellowish or brownish crusts; these finally drop off and leave a hyperæmic or pigmented spot. As a rule they appear in crops, or there may be a violent outbreak and then an outcropping from day to day of a few scattered blebs or clusters of vesicles for several weeks, and then a period of comparative or complete abeyance intervene, succeeded sooner or later by another outbreak of bullous lesions; or a complete change to the erythematous, multiform, or other type ensues. When bullous outbreaks follow each other rapidly one after another the involved skin at times tends to become infiltrated and to assume an eczematous aspect. The subjective symptoms of itching and burning are as a rule present to an intense degree. Variable systemic disturbance, which may be in some cases of a more or less grave character, usually ushers in and accompanies the early part of the outbreak, and light febrile action, chilliness, and similar symptoms may in fact continue throughout the attack. On the other hand, after the first outburst the patient's general condition may be practically undisturbed, although the cutaneous phenomena be quite pronounced.

The *mixed type* of dermatitis herpetiformis is characterized by an intermingling of the lesions of the various types already described. Erythematous plaques, papules, urticarial wheals, vesico-papules, vesicles, small blebs and pustules, occurring singly and in groups and aggregations, make up the cutaneous picture; the lesions appearing in irregular confusion from day to day, or in crops at shorter or longer intervals. As a rule, large blebs and pustules are not to be seen, or if present are in scant number. Excoriations and pigmentation are sooner or later added to the other symptoms. Where the lesions are closely aggregated and crops follow rapidly one after the other, the skin may, as in the other types, become somewhat thickened and infiltrated. At times the eruption presents the characteristics of eczema, erythema multiforme, urticaria, herpes iris, zoster groups, and pemphigus. The disease rarely begins or persists as a multiform eruption; in fact, this phase of dermatitis herpetiformis is more of a clinical variety than a distinct type, and is probably most frequently seen as a temporary break occurring during the course of the erythematous, vesicular, or bullous type, or foreshadowing the advent of a change in the type of the disease or a return to comparative or complete quiescence. As in the other forms of the disease, the itching and burning are troublesome symptoms. There may or may not be general systemic disturbance; it is rarely of a severe or grave character.

The following case (reported in full in the *Journal of Cutaneous and Genito-Urinary Diseases*, February, 1890), which was under my observation for a period of some months, is a good example, in the beginning, of the bullous type, changing later to the mixed variety, and then to the erythematous:

J. B—, aged thirty-four, laborer, of Irish birth, came under my care in November, 1886. His condition was then as follows: His whole integument was closely covered with discrete and confluent blebs, varying in size from that of a large pea to that of a hen's egg, and as a rule without areolæ. The lesions for the most part were distended; others were more or less flattened. The eruption was profuse, and spared no portion of the body. The skin between the bullæ was in some places normal in appearance, in other places it was of a pinkish or purplish tinge. The conjunctivæ, as well as the mucous membranes of the mouth, were likewise involved in the process. Symptoms were also present, such as coughing and the occasional spitting of small flakes of membrane, indicating that the laryngeal and tracheal mucous membranes were similarly invaded. The eruption exhibited no attempt at symmetrical arrangement. The temperature was above normal and the pulse was accelerated. There were mental depression and profound general weakness. In short, every symptom of a serious pemphigus was present, and at this time such it was considered. The history of the development of the disease and its further course, however, indicated a severe case of bullous dermatitis herpetiformis.

The former history of the case was as follows: The previous July he contracted scarlet fever from one of his children; the attack was severe and of the

anginose type. Ten days after thorough convalescence had set in, and when desquamation had ceased he left the house one evening to join some friends, and drank heavily of beer, which had been his custom before his illness. On the following day it was noticed that he was feverish; at the same time there appeared a band of papules, papulo-vesicles, and vesicles around the neck, a similar band around the ankles, extending upward about six inches, and a four-inch band around the wrists. The papules rapidly developed into vesicles, and these for the most part became confluent. The primary vesicles were small. New parts were soon involved, and finally the whole surface shared in the eruption, the lesions being at first similar to those which had appeared on the neck, wrists, and ankles. The eruption at that time consisted of discrete and confluent vesicles and bullæ, some of the latter being as large as a walnut. This attack lasted nearly four weeks, at the end of which time there was, according to his statement, scarcely a vesicle or bleb to be seen. A short time later he had a feeling of intense burning under the skin, followed the next day by a general crop of vesicles and bullæ. These were not quite so large or so distended as the bullæ of the former outbreak. From this time on until coming under my care crop after crop developed, before one had subsided a new outbreak making its appearance. The constitutional symptoms thus far had been a variable elevation of temperature, an increase in the pulse rate, irregularity of the bowels—diarrhoea followed by constipation—and a coated tongue.

After coming under my observation new blebs continued to make their appearance in variable number and irregularly for ten days or two weeks, both upon the general surface and buccal mucous membrane, and then followed a new crop of blebs over the face and trunk, with a tendency to form festoon and circles. A few weeks later, most of the old lesions having disappeared, there was an extensive general erythematous and papular eruption, assuming the shapes of rings, segments of circles, and in places forming festoons; in the segmental lesions there was a strong disposition to vesiculation. Irregular outcropping of similar erythematous and papular lesions, with here and there scattered vesicles and a few blebs, continued for a short time, and then rapid improvement set in, and the patient returned home. Here he remained for three months, during which time the eruption had been to a great degree in abeyance. At the time of his return to my care the skin was irregularly covered with an erythemato-papular eruption, with a few scattered small and large discrete and grouped vesicles and blebs. A feeling of burning was complained of, but itching was at this time comparatively slight. One or two ruptured blebs could be seen in the mouth. The patient's condition now varied from day to day and week to week, a more or less profuse erythemato-papular eruption, scattered blebs, and groups of vesicles making their appearance from time to time. A month later there was another general outbreak, partaking more of the nature of a well-marked erythema multiforme. The trunk, limbs, and face were covered with erythematous and papular rings and segments. Later, especially upon the segmental lesions, bullæ made their appearance, maintaining in a great measure their segmental shapes. There were also a few scattered, flattened, erythematous elevations, upon which could be seen irregularly distributed vesico-papules and vesicles, somewhat similar to the patches in herpes zoster. The temperature at the beginning of this as well as previous general outbreaks showed an elevation of from one to three degrees; and until the outbreak had well subsided, a tendency to slight elevation, especially in the even-

ing, could be noticed. There was but little disposition toward pustule formation, the eruption at this time partaking of the features of erythema multiforme, herpes iris, and pemphigus, more especially the first named. About a month later twenty to thirty dime-sized blebs made their appearance, seemingly arising from healthy skin. The case progressed in this same variable manner, the skin never being entirely free, and with, at irregular periods, fresh, more or less general erythematous, erythematopapular outbreaks, with several or more scattered vesicles and blebs. A period of comparative quiescence intervened after a time, and the patient withdrew from my care. A year or so later I heard of him again, and learned that the same conditions had continued with more or less variability, the manifestations for the most of this time being milder, and similar to erythema multiforme.

Pathology and Morbid Anatomy.—The pathology and morbid anatomy of dermatitis herpetiformis have as yet scarcely received any study. That the disease is of a neurotic nature can hardly be questioned, the eruptive phenomena being due probably to some obscure functional or possibly organic derangement of the nervous system.

The vesicles, pustules, and blebs, although often of a violent character, are, studied from a clinical standpoint, superficial, and presumably involve the epidermic tissue only. If they involve the papillary and lower cutaneous layers, it must be to an exceedingly slight extent, as scarring or atrophic changes rarely, if ever, occur. The conditions are doubtless variously similar to those observed in eczema vesicles, simple herpes, herpes zoster, and pemphigus. The erythematous, papular, and urticarial lesions are in all probability of the same nature as those occurring in ordinary erythema multiforme and true urticaria.

In cases in which crop after crop follow in rapid succession, infiltration and thickening, slight or pronounced, of the whole cutaneous structures of the involved areas sometimes take place; this, however, disappears as soon as a period of quiescence intervenes. The only apparent more or less lasting pathological alteration noticed is pigmentation, variable in amount; it is not always present in the milder types, but is most marked in cases of a severe and persistent character. This pigmentation, should the disease abate or come to an end, would scarcely prove permanent.

Etiology.—The behavior of dermatitis herpetiformis, the similarity of the various cutaneous phenomena to those of urticaria, erythema multiforme, herpes zoster, and pemphigus, lead to the belief that the disease is essentially neurotic. It would indeed often appear as if the normal control of the various nutritive and other changes in the skin had been in some obscure way lost or perverted. It is possible that, in some cases at least, this may be due to reflex action, possibly reflex irritation of the vasomotor centers; for in many cases—the one first cited here, for instance—although the disease be of a somewhat extensive and persistent

character, extending over years, yet, so far as our present methods of study disclose, there is found nothing to explain the cutaneous symptoms. In other cases—in a large number, in fact—the disease manifests itself after serious mental and moral shock or emotion, nervous exhaustion, mental worry, physical or nervous breakdown, exposure to cold, and similar causes. In some cases general debility and debilitating influences may rightly be considered as responsible, in part at least, for a continuance of the disease. The possibility of renal disease as an etiological factor should always be considered. In some instances, too, the disease shows itself during and immediately following pregnancy (*herpes gestationis* so called). Several cases have been reported from time to time with cutaneous symptoms similar to those of dermatitis herpetiformis, in which septicæmia was apparently the cause; such cases usually end fatally. In a fair proportion of patients, however, the general health remains seemingly undisturbed. In extensive and long-continued cases, it is true, the intense itching and consequent loss of sleep give rise to depression and other symptoms of nervous exhaustion.

In several of my own cases an analytical study of the urine was made, but was barren of results. In four cases reported by Winfield, however, glycosuria was present. The disease is observed in both sexes, and almost at any age, but it is by far most common in young and middle-aged adults; it is rare in young children.

Diagnosis.—At various periods in its course a case of dermatitis herpetiformis may resemble slightly or even strikingly eczema, erythema multiforme, urticaria, and pemphigus; and not infrequently, indeed, the clinical picture may be for a time closely similar or even identical to one of the above-named diseases, and without knowledge of the former history and the course of the disease a mistake could be readily made. Several factors need to be kept in mind in the diagnosis as being more or less distinguishing: Chronicity, with or without remissions or short or long intermissions; multiformity, tendency toward grouping, disposition to change or variability in the type, itchiness, with sooner or later slight or marked pigmentation.

The disease differs from eczema in that the vesicles are larger and more irregular in outline, being stellate, quadrate, angular, tend to form in groups of two, three, or more lesions, and exhibit but little, if any, disposition to spontaneous rupture. The irregular distribution and often the profuseness of the eruption in dermatitis herpetiformis, its chronicity, variability, and capriciousness, may also be utilized in the differentiation. The papules of dermatitis herpetiformis differ from papular eczema by their larger and less regular shape, the tendency to distinct crop-like outbreaks, disposition to appear in groups of two or several lesions, their slow evolution, chronicity, and obstinacy.

Erythema multiforme is to be distinguished from the erythematous, vesicular, and bullous types of dermatitis herpetiformis, especially the first named. Erythema multiforme is, however, an acute disease running a course of ten days to several weeks, and is unaccompanied by intense itching; moreover, its distribution is rarely as irregular or general as that of dermatitis herpetiformis. The vesicles and bullæ—herpes iris, erythema bullosum—which are occasionally seen in erythema multiforme have their origin in pre-existing erythematous lesions; while this also happens in dermatitis herpetiformis, many of the vesicles and bullæ will be found to arise from apparently healthy skin. In doubtful cases several days'—or at the most a few weeks'—observation would lead to a correct conclusion.

Urticaria, as commonly met with, bears a slight resemblance to erythematous dermatitis herpetiformis, but the manifestations of the former are more or less uniform, with but little tendency to the formation of groups, segments, and circles; the bullæ at times seen in urticaria—urticaria bullosa—arise from pre-existing wheals, show no disposition to irregular or multiform shapes, and lack the tendency to grouping observed in the bullous type of dermatitis herpetiformis. Urticaria is, moreover, as usually met with, an acute disease.

Pemphigus differs from the bullous type of dermatitis herpetiformis in that the lesions of the former are usually larger, and show no special tendency to occur in groups or to assume irregular, angular, or multiform shapes; the pemphigus blebs, moreover, appear as a rule from sound skin, and the disease lacks the small vesicles and vesicular groups and occasional small pustules and pustular groups usually found intermingled in the bullous eruption of dermatitis herpetiformis. In pemphigus, itching is wanting or slight, whereas in dermatitis herpetiformis it is one of the most troublesome symptoms. The reported cases of "pemphigus pruriginosus" are doubtless, in many instances at least, examples of dermatitis herpetiformis. Pemphigus with itching as a symptom may be distinguished by the differential points already given, especially when considered in connection with the known capriciousness of type in dermatitis herpetiformis. The constitutional symptoms of pemphigus are usually quite marked—much more so, as a rule, than observed in dermatitis herpetiformis.

Prognosis.—As to the relief for an immediate attack, much, as a rule, may be promised, but as to cure or permanent freedom from outbreaks the prognosis can not be too cautiously guarded. It is not to be forgotten that dermatitis herpetiformis is a particularly persistent and chronic disease, capricious in its behavior and course, and rebellious to treatment. All types of the disease are almost equally obstinate, and, in fact, it is difficult to say how long in a given case a particular type will prevail, as a tendency to change in type in the character of the eruption, as already

stated, is a not unusual feature of the disease. Those cases showing a prevailing tendency to the erythematous variety are usually least troublesome, and probably offer more promising chances for eventual recovery. The vesicular expression of the disease occurring in connection with pregnancy or the parturient state, known formerly as herpes gestationis, is also one of the more favorable varieties. Those cases which are apparently due to physical or nervous exhaustion, mental worry, and like conditions, may often be benefited and sometimes cured by a modification or removal of the causes. The pustular and bullous types are usually the most troublesome, and are often of a more serious character than the other varieties. A fatal ending is possible in the grave cases of the disease, especially in those cases associated with septicæmia; but it must be conceded, on the other hand, that dermatitis herpetiformis usually persists without compromising life, and that in the majority of patients, in fact, the general health, considering the violence of the eruptive phenomena, remains comparatively undisturbed.

Treatment.—For the best results, each case of the disease must be carefully studied, and all possible etiological predisposing or exciting factors considered. There are no specific remedies—no remedies, indeed, of any direct value; constitutional treatment must be upon general principles, based upon what may be thought to be the underlying causes. Of greatest importance is the proper regulation of the patient's mode of life; excesses are to be avoided, excitement or anything having a detrimental or disturbing influence upon the equilibrium of the nervous system guarded against. The diet should receive attention; excessive meat-eating, indulgence in coffee, tea, and other stimulants interdicted; all indigestible food should be abstained from, the diet being plain but nutritious. In some instances a rigorous milk diet seems to have a favorable influence. Open-air amusements, light exercise or calisthenics, and pleasant surroundings have a value and should be encouraged. In short, the patient should, so far as is possible or commensurate with his or her means, have all the advantages of Nature's kindly influence.

The condition of the nervous system especially should be looked after, and everything done to improve its tone, for it will be found in many cases that the nervous vigor is below the normal standard; and in these cases arsenic, in minute tonic and alterative doses, and strychnia and quinine in moderately full or full doses, constitute the most valuable drugs. Phosphorus should also be tried within safe limits, particular attention being exercised that the digestion be not disturbed. If an anæmic or chlorotic condition exists, iron and manganese preparations are indicated, and will often do good. If a distinct gouty or rheumatic tendency or history is presented, a course of alkalies with tonics should be advised. The condition of digestion and the state of the alimentary canal must be

inquired into, the bowels should be kept free, and if medication is necessary for this latter purpose a saline laxative, taken before the morning meal, is to be preferred. A tolerably free purgation with a saline will not infrequently have a very positive influence in moderating the severity of a sharp attack, proving in this manner of great benefit, although it apparently makes no permanent impression upon the course of the disease. In cases in which debility seems to be the predisposing and promoting factor, cod-liver oil, malt preparations, tonics, and a nutritious but easily digested diet are called for. In exceptional instances, more especially of the vesicular and bullous types, arsenic pushed to the point of tolerance will be found valuable in controlling the eruption; on the other hand, in some cases large doses of this drug do harm. Crocker mentions full doses of belladonna as useful in some instances. General galvanization I have found of benefit in one or two cases.

The external treatment is of great importance, and is demanded in every case. Large blebs and pustules should be incised or punctured, the remedial applications acting more satisfactorily when this is done. As a rule, those remedies useful in controlling itching are the most valuable in this disease. Duhring states that the only external remedies from which benefit is to be expected are stimulants, especially those which act revulsively. This has in part been my own experience, although many cases are met with which will tolerate only the milder and soothing applications. As a rule, ointments are not suitable for the erythematous type of the disease. With this exception type does not to any great extent influence the selection of any particular method of external treatment. It may be safely said, however, that lotions are, upon the whole, more acceptable and efficient than ointments. One of the most valuable lotions is liquor carbonis detergens, with ten or more parts of water up to the pure solution; this, followed with a mild antiseptic salve, such as the salicylic-acid paste, or one of boric acid or thymol, will prove valuable in some cases. Liquor picis alkalinus, one to four drachms to the pint of water, with or without a supplementary mild salve, is another useful application. Thymol lotion, one half to two or more grains to the ounce, with a few minims of glycerin, and sufficient alcohol to secure its solution, is occasionally of value. The same may be said of resorcin lotion, two to twenty grains to the ounce; of ichthyol lotion, ten to sixty grains to the ounce; carbolic acid, one to three drachms to the pint; of a saturated solution of boric acid, to which is added one or several of the above remedies as the active ingredients. Zinc sulphate lotion, one half to two or more grains to the ounce, and menthol lotion, one half to ten grains to the ounce of liquid cosmoline or vaseline, may also be mentioned as worthy of trial in the endeavor to relieve the pruritus and promote the disappearance of the eruption.

In certain cases tarry salves, using the oil of cade, or *pix liquida*, one or two drachms to the ounce, do good. I can speak favorably of a tarry ointment made up on one or two drachms of *liquor carbonis detergens* to the ounce of simple cerate. Duhring extols an ointment of sulphur, two drachms to the ounce, as especially useful in the vesicular, pustular, and bullous varieties, more especially the first named. It is not advised in the erythematous variety. It should be rubbed in vigorously, "with sufficient force to break down the vesicles, pustules, and blebs as speedily as possible." It is a strong, stimulating remedy, and should at first be used cautiously.

In many cases alkaline baths of sodium carbonate or sodium bicarbonate, two to six ounces to the bath, in which the patient remains for ten to twenty minutes, supplemented by a dusting powder, or by one of the milder ointments or lotions already mentioned, afford comfort and relief. Potassium sulphide baths may also be tried in persistent, rebellious cases. In bullous cases of an extensive and severe grade the continuous water bath might be tried, with the hope of relieving the patient's suffering and shortening the outbreak; this is known to act with benefit in some cases of pemphigus, and doubtless would do equally well in bullous dermatitis herpetiformis. In cases of particularly irritable skin, and in other cases also, bran and starch baths are of service.

POMPHOLYX. (A. R. ROBINSON.)

Synonyms: Cheiro-pompholyx (Hutchinson); Dysidrosis (T. Fox).

Definition.—An acute inflammatory affection characterized by the symmetrical development upon the palms of the hands, and generally also upon the soles of the feet, of deep-seated, clear vesicles, usually grouped, which afterward become opaque, and in a few days disappear by rupture or absorption, leaving a non-inflammatory skin behind.

Symptomatology.—This affection was first described by Dr. Tilbury Fox and Mr. Jonathan Hutchinson, independently of each other, and from observations made on the same patient. The anatomy was first described by myself in 1877, and in 1878 by Fox and Crocker. Since that time many cases have been reported, some of which were not typical cases, some were examples of eczema, and some of hidrocystoma.

The clinical description of the eruption, as given in the original papers of Fox and Hutchinson, is classical, and very little has been added to our knowledge of its characters by subsequent writers. The disease is not a frequent one, especially in its severer forms, and even in the milder forms it may be called a rare affection. It is almost always a symmetrical disease, and rarely appears except upon the hands and feet. The hands are

always affected, but the feet sometimes escape, and even when upon both hands and feet the former are always the more severely affected. The eruption commences with burning and itching, followed quickly by the formation of deeply seated vesicles, singly or in groups upon some part of the hand, usually between the fingers and upon the palmar surface, and very rarely upon the dorsal surface.

In the severer cases especially many of the lesions are grouped; and even in the milder forms, when few lesions are present, I have found a tendency to grouping. The vesicles at first are quite transparent, resembling closely the vesicles of cases of scabies, or of neurotic eczema, and have been compared to boiled sago grains. The contents of the lesions gradually change in appearance, becoming more and more opaque, and in a few days are pustular in character. The contents are either neutral or alkaline in the early stages. When the vesicles are grouped they often coalesce and form bullæ, from the size of a pea to one inch or more in diameter. The lesions, whether vesicles or bullæ, do not rupture spontaneously, but, on account of their location, are frequently ruptured by traumatism. Usually, within from one to two weeks, the contents have dried up or been absorbed and the detached epidermis exfoliated, leaving the skin beneath more or less red, but never eczematous in character.

In the acute stage, if many lesions are present, the hand is stiff and painful; but in very mild cases the lesions are accompanied only by a slight pricking and tender feeling. Usually the eruption is accompanied by exaggerated perspiration of the hands, or, more correctly stated, individuals subject to "dysidrosis" habitually perspire freely. In rare cases an eczema has been observed to follow the eruption. Sudamina lesions are frequent, but they are not usually recognizable to the naked eye. The disease is very liable to recur, and varies in degree in different attacks. Sometimes both hands and feet are attacked, at other times only the hands, and again the whole eruption may consist of only a few isolated lesions which rapidly reach maturity and disappear quickly. Persons suffering from this disease are usually in a condition of so-called nervous depression, either from worry or other cause. A short history of the patient from whom the accompanying microscopical drawings have been taken will serve as a good illustration of the character of the disease:

L. H—, forty-seven years of age, has been a fireman since he was twenty-five; was married at the age of twenty. Previous to his marriage a few vesicles would appear occasionally upon his hands, but the first severe attack was when he was twenty-five years old. This attack lasted two months, appearing both on the hands and feet, but first upon the hands, and about one month later upon the feet. About six years later he had another severe attack, while in the interval mild attacks, in which only a few lesions appeared, frequently occurred. It was during this severe attack that I first saw him—over sixteen years ago. It commenced on the palms of the hands, near the wrist,

and spread over the entire palms and between the sides and on the palmar surface of the fingers. Since that time he has had many attacks of the eruption, some severe and others mild. If he is called upon to undergo severe exertion, the eruption is certain to appear a few days subsequently. The manner of appearing of the lesions and their course is peculiar and characteristic, and show but little variation at different outbreaks. The eruption is always preceded by a tingling or burning sensation in the parts, and the patient is more than usually depressed and nervous. The lesions appear as small vesicles deeply seated in the skin. They may be isolated, or collected in groups of from two to ten or more. Very frequently the lesions forming a group are about the same age and size. The eruption is always symmetrical, and often exactly corresponding parts of the hands or feet are affected at the same time. The lesions forming a group frequently unite to form a bulla, and when the contents of the bulla dry up and are absorbed, the skin which covered the lesion becomes hard and dry. The vesicles contain at first a clear liquid; this afterward becomes more and more opaque, but rarely yellow in color. The vesicles never have a red, inflammatory base. They are deeply seated, and have the boiled sago-grain appearance. Afterward they increase in size and are raised. They are never acuminate in form, but have a rounded or more or less flattened top. Isolated lesions on the palm rarely become elevated above the general surface. If a group forms they are always more or less elevated, as also isolated lesions on the sides of the fingers. After absorption of the contents, or mechanical rupture of the lesions, a reddened surface is left behind. At no time have I observed a cracked or discharging surface or infiltrated skin result from the eruption. The feet are not always affected, and often when many lesions are on the hands there may be only a few upon the feet. The patient is habitually nervous and depressed in spirits, and perspires a great deal.

Anatomy.—All who have studied the subject agree that the lesions are formed in the rete, but there has been much difference of opinion as to the nature of the contents of the vesicles and their origin. Dr. Tilbury Fox regarded the contents as composed of retained sweat, and that the lesions were the result of obstruction within the rete to the natural escape of sweat by the excretory duct to the free surface. Mr. Hutchinson, Dr. Thin, myself, and all the late writers who have worked upon the subject, maintain that the disease is not one of the sweat apparatus, and that the contents of the vesicles consist of serum, and not sweat.

I consider the disease a neurosis, and closely related to a herpes or pemphigus vulgaris. As the later observations of Williams, Santi, and others are only confirmatory of my own previous studies and conclusions, I will briefly state the changes I have observed. In the earliest stage the vesicle contains clear serum, and few, if any, formed elements; afterward pus-corpuscles appear and increase in number with the life duration of the lesion until its acme of development, gradually changing the color of the contents and making them more and more opaque. The fluid is either neutral or alkaline in the early stage, and never acid. It contains a large amount of albumin and some fibrin. The liquid comes

from the papillary blood-vessels, and passing between the rete cells collects in different situations within this structure its different lesions. Usually the vesicle forms in the upper part of the rete two or three layers of cells from the stratum lucidum. The liquid causes degeneration of a few cells, and, collecting, presses the surrounding cells in different directions and changes their form. They are gradually flattened out, especially those nearest the vesicle. The larger the vesicle becomes the more the cells are flattened and drawn out, until many of them resemble fibers in form. If the lesion is multilocular, as in Fig. 18, the band between the

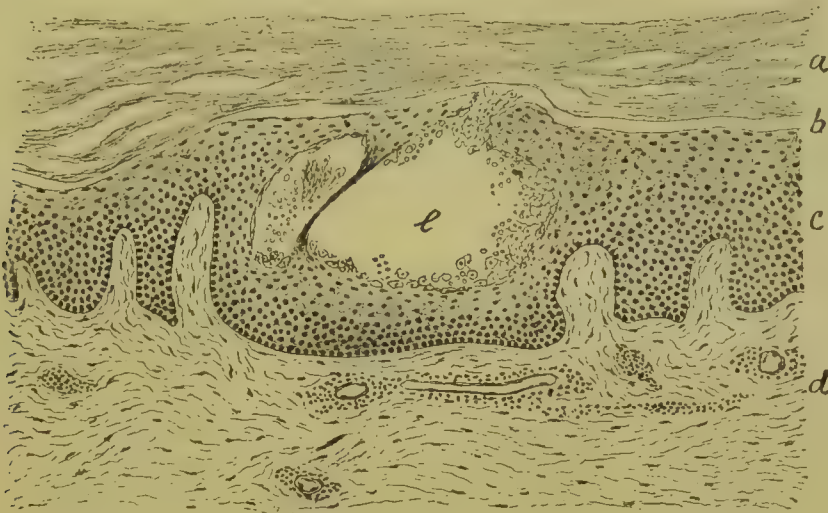


FIG. 18.—Vesicle in pompholyx.

a, corneous layer; *b*, stratum lucidum; *c*, rete; *d*, corium; *e*, vesicle.

loculi is composed of rete cells, drawn out to perhaps five or six times their normal length. There may be several variously sized bands in a single lesion. The stratum lucidum is usually pushed upward by the fluid, and occasionally is ruptured, as in Fig. 1. The corneous layer often shows many small loculi throughout the whole section, caused usually by escape of sweat between the layers of corneous cells.

The blood-vessels in the papillæ are at first but slightly changed, but later there is considerable perivascular round-cell collection in the upper part of the corium and into the papillæ, and sometimes the dividing line between the rete and connective tissue is obliterated by the excessive round-cell collection at that place. The round cells also penetrate the rete, and sometimes make it impossible to recognize the form and outline of the two or three lower rows of rete cells. The serum, passing from the papillary blood-vessels to the vesicle, changes the form of many of the rete cells, which become drawn out, paler in appearance, and more finely granular. Sometimes a single cell appears to reach almost from the corium to the corneous layer. The earlier the lesion the less drawn out the rete cells; the larger the vesicle, the greater the lateral compression;

and the nearer the corneous layer, the less the change in form and constitution.

In the later stages of the disease, when several adjoining papillæ are affected, the cell infiltration is considerable, extending not only into the papilla but along the blood-vessels of the upper part of the corium. This is shown in Fig. 19, which represents only a comparatively early stage of the vesicle existence. The subcutaneous tissue appears to be normal. The sweat glands within the corium were always found to be normal.

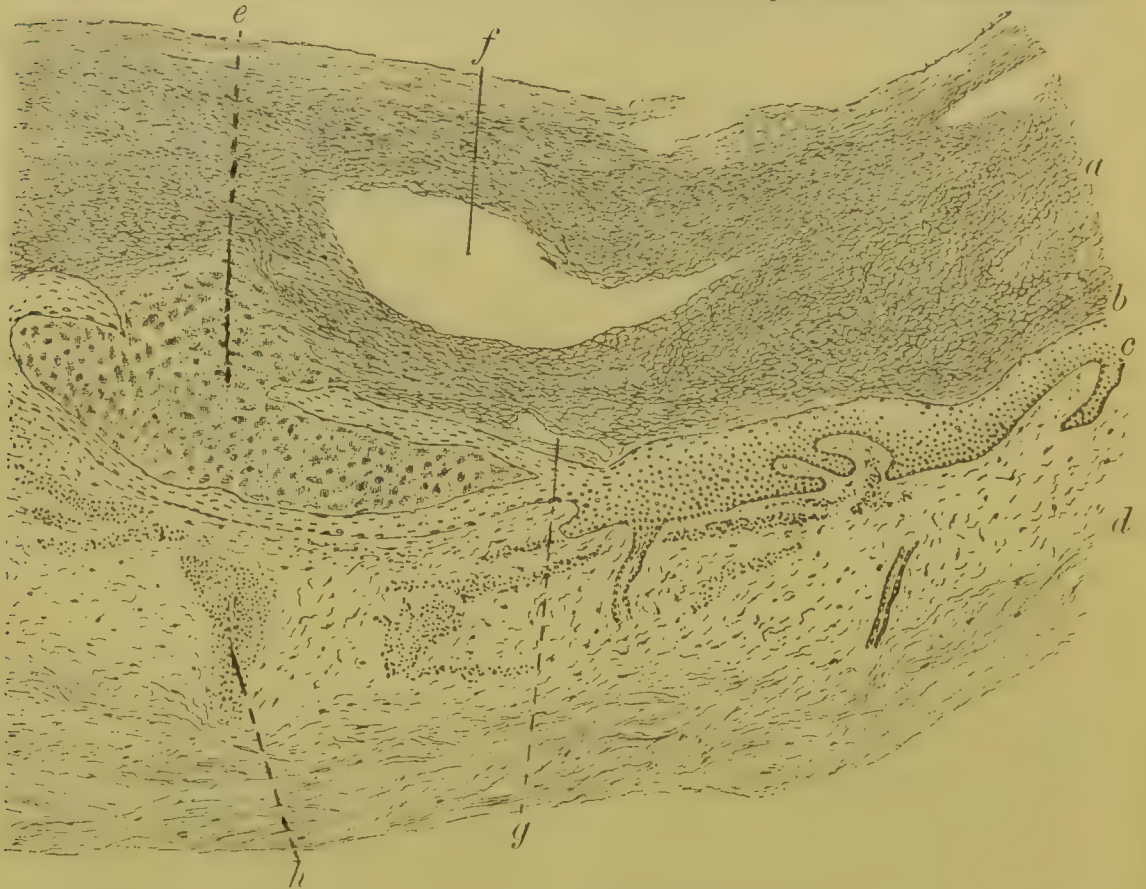


FIG. 19.—Vesicle in pompholyx.

a, corneous layer; *b*, stratum lucidum; *c*, rete; *d*, corium; *e*, vesicle, consisting of serum and pus-corpuses; *f*, vesicle (sudamina); *g*, sweat duct; *h*, perivascular cell infiltration.

Within the rete there seemed to be no connection between the sweat duct and the vesicle. Within the corneous layer, however, as in Fig. 19, a vesicle may form from retained sweat. This occurs in cases of hyperidrosis as I have frequently observed, and is independent of the pompholyx lesions.

In a section from a vesicle of a classical case of neurotic eczema of the hands I found the location of the vesicle, the character of the contents, and the changes in the rete cells identical, except that the process was not quite so sharply limited—a further proof of the inflammatory origin of the lesions in pompholyx, and the inappropriateness of the term *dysidrosis* for this disease.

Etiology.—The disease appears in persons of a nervous temperament, or whose general nutritive condition is below normal. According to present statistics, it appears more frequently in women than in men. Many of those affected sweat greatly, especially upon the hands and feet. Mr. Hutchinson has not seen it occur before puberty or in old persons. Crocker observed a case in a girl of twelve, and I had a case about the same age, also in a girl. Worry, or other causes of great nervous depression or nerve fatigue, are frequent factors in its production.

Diagnosis.—The disease is to be diagnosed from vesicular eczema. From eczema of the hands the diagnosis is sometimes difficult, and Hardy, Kaposi, Hallopeau, and others regard pompholyx as an acute eczema. From ordinary weeping eczema the diagnosis is not difficult. In a well-marked case of neurotic eczema the lesions are as much grouped as in pompholyx, and the sago-grain appearance is also present, as well as the tingling and feeling of tension; but the inflammatory swelling is greater, the lesions are soon more acuminated; they are liable to exist upon the backs and sides of the fingers more than upon the plantar surfaces, and they usually rupture, leaving behind a more or less broken and weeping surface. The presence of an occasional sago-grain-like vesicle between the fingers of one or both hands hardly justifies the diagnosis of pompholyx, for, as we have seen, the anatomical structure of both eczema and pompholyx lesions may be very similar.

Prognosis.—The eruption usually disappears spontaneously in about ten to fourteen days, but an attack may last several weeks. The disease is very liable to return repeatedly with intervals of a few weeks, months, or years.

Treatment.—There is no local application which is of any service in removing the eruption or shortening its natural duration. Bran-water, or a weak solution of bicarbonate of potassium, or simply cold water, is of benefit in the acute stage to reduce swelling and feeling of tension in the hands. If painful, an oleate of morphine (two per cent) can be employed. Lassar's paste or cold-cream are also useful preparations. Internally, the majority of the patients require tonics to improve the general nutrition and tone up the nervous system. Proper food, good hygienic surroundings, and such tonics as iron, quinine, strychnine, and hypophosphites are recommended for their beneficial general effects. All causes of excitement, worry, and nervous depression should be avoided if possible. Alcoholic stimulants, tobacco, tea, and coffee are probably injurious. Arsenic is the only drug I have found to possess special action in this disease. When given in a sufficient dose to obtain the physiological effect, I have often seen the eruption disappear quickly. It has seemed to me to act as promptly as it does in pemphigus, and this action makes it probable that the disease is a neurosis.

HERPES. (JOSEPH ZEISLER.)

Deriv., Gr., *ἔρπειν*, to creep.

The term *herpes* has in former years served to designate most different and varied affections of the skin. It was used in olden times for cutaneous eruptions which had a tendency to peripheral extension, to a serpiginous progress. This feature can, however, be observed in quite a number of skin diseases, and, while being to a certain extent characteristic of herpes zoster, does not at all constitute an essential element in the more common herpes simplex. The term has also, even up to modern times, been associated, particularly by French authors, with a hypothetical dyscrasia, a "herpetic" condition of the system which was supposed to be productive of, besides other various ailments, peculiar eruptions called *herpetides*, but such views are rapidly sinking into oblivion. The Vienna School of Dermatology employs even now the designation *herpes tonsurans* for what we call ringworm or tinea and also for that entirely different affection, *pityriasis rosea*. All this may show how defective and inaccurate our nomenclature is, and how much we are in need of an international settling of this matter.

In the following pages the term *herpes* is used in the original sense of Willan, which is now pretty generally accepted. We understand by it *a noncontagious, acute, typical eruption characterized by groups of vesicles*. Whatever might be added to further define it is not essential, but follows from the laws of general dermal pathology. The above definition includes such affections as herpes iris and circinatus and herpes gestationis; these will be treated of elsewhere, while here only herpes simplex and herpes zoster are to be considered.

At this place it might be mentioned that some authors make no essential difference between zoster and simple herpes, but regard the latter only as a variety of the former. Baerensprung was one of the first to express such a view, and recently Epstein (*Viertelj. für Derm. und Syph.*, 1888) made a very able effort in this direction. The majority of writers, however, still separate the two forms, principally on clinical grounds; and we hold that, as long as the etiology of herpes is not established on a more solid basis, the differences of the two are sufficiently distinct to hold them apart.

HERPES SIMPLEX.

Definition.—An acute, noncontagious, benign disease of the skin, characterized by one or more groups of vesicles on a reddened basis, and running a typical course.

According to its localization, two chief varieties of this dermatosis may be distinguished—herpes facialis and herpes progenitalis. This differentiation is justified on clinical and etiological grounds.

HERPES FACIALIS.

Synonyms: Herpes Labialis; Herpes Febrilis; Hydroa Febrilis.

This is a very common trouble, and is popularly known as *cold-sore* or *fever-blisters*.

Symptomatology.—Its appearance is usually preceded by indistinct subjective sensations on the region about to be affected, such as a slight burning, tingling, itching, or a feeling of tension, and often by a general sense of chilliness or even shivers. At the same time there may be noticed on that hyperæsthetic area a faint swelling, which very soon develops into a papular eruption. Within a few more hours, particularly if night intervenes, these papules are transformed to smaller or larger vesicles, situated on a reddened base; with this the acme of the process is reached. The vesicles are then pinhead to pea sized, fully distended, and filled with a clear, transparent, serous fluid. They stand closely together in groups of six to twelve, forming irregular patches, of which there are, as a rule, only one or two, rarely more. Quite frequently several of the lesions may, by peripheral extension, coalesce to larger bullæ. Within the next few days their contents assume an opaque and even a purulent aspect, the vesicles gradually dry up and form brownish crusts, which finally drop off, leaving erythematous, slightly pigmented, and somewhat scaly spots, which soon, without any cicatrization, give way to a perfectly normal skin. The whole process is finished in from eight to ten days; only when the scabs are forcibly or accidentally removed before the epidermis has been regenerated, a raw, oozing surface is exposed, which requires a little longer time to heal up.

The favorite location of the eruption is around the mouth, particularly on the lips, and involving their vermilion border. This predilection has given rise to the designation *herpes labialis*, still used by some authors. But any part of the face below the forehead may be affected, especially the chin, the *alæ nasi*, the cheeks, and the auricles. Nor are the mucous membranes exempt, only that here it is rare to see the trouble in the vesicular stage, but usually in the form of roundish, sharply outlined, grayish-white abrasions or exfoliations. These are often called popularly "canker sores." The mucous membranes of the mouth, especially of the lips, the palate, the tongue, the throat, and the nostrils may be thus affected.

Herpes facialis is a frequent concomitant of many acute febrile diseases, chiefly those of a catarrhal nature, as tonsillitis, bronchitis, or pneu-

monia, and accompanies a simple coryza so often as to justify its common name—cold-sore. Again, it often occurs with derangements of the digestive organs, as gastritis or enteritis. In former times its presence was considered as strong negative evidence to exclude the diagnosis of typhoid fever, but such a view is by no means borne out by exact observations; nor is it justified to consider the appearance of a herpes febrilis in itself as a favorable sign of the character and the course of the main trouble, for it sometimes may come on during a fatally ending febrile disease. Some people seem to have a marked predisposition for it, and develop it upon the slightest exposure or upon contact of the lips with some irritating substance; in many women a labial herpes springs up with each menstrual period. On the other hand, many persons, even such as have a very delicate skin, seem to be absolutely immune against it.

Pathology.—The pathology of the affection is by no means clear, for its association with so many different conditions, on the one hand, and its occurrence as an apparently independent, idiopathic trouble, on the other hand, does not indicate its true cause. A neurotic disturbance, either *in loco* or through reflex influence from neighboring ganglia, seems quite plausible, but has not been proved. Gerhardt tried to explain it as an irritation of branches of the fifth nerve, which, passing through narrow, bony canals, are during the fever easily compressed by their accompanying congested blood-vessels. That herpes simplex is looked upon by some writers as a sort of abortive zoster has been mentioned before. Numerous attempts have been made to demonstrate the microbic nature of herpes, and quite recently St. Clair Symmers (Brit. Med. Jour., December 19, 1891) succeeded in cultivating a peculiar parasite from a case of labial herpes. It seems premature, however, to draw definite conclusions from isolated experiments in this direction.

Diagnosis.—The diagnosis of facial herpes is, as a rule, very easily made, if the characteristic features above described are kept in mind. It differs from herpes zoster by its marked tendency to recur, by its frequently bilateral distribution, and by the milder degree of the accompanying nervous phenomena. From eczema it can be distinguished by the larger size of the vesicles, which show little disposition to break down, and therefore cause no oozing; by the absence of considerable itching; by the typical course and prompt recovery. When crusts have formed herpes might resemble an impetigo, but the history of the case and a few days' observation will easily settle the diagnosis.

Prognosis.—As far as the cutaneous lesions are concerned, the prognosis is always favorable. But its proneness to frequent recurrence constitutes, at least in the case of some ladies, a very undesirable element.

Treatment.—Protection from irritation, to keep the vesicles from rupturing, is the main indication. The application of a mild dusting

powder, the lotion of calamine and zinc, a ten-per-cent solution of ichthyol, and zinc ointment, with the addition of five parts each of boric acid and ichthyol, will usually serve the purpose of drying up the eruption. For the prevention of anticipated menstrual herpes the local use of spirits of camphor has been recommended. Hardaway suggests the rubbing on of borax in substance to abort an incipient herpes. In children, the painting on of flexible collodion might be advisable, to protect the parts from friction or picking.

HERPES PROGENITALIS.

This variety of herpes simplex goes often by the name of *herpes præputialis*, but as it affects both sexes alike, this designation is not quite correct.

Symptomatology.—It consists in the eruption of grouped vesicles on or about the genital organs. In men, the most common seat of the affection is the inner præputial surface; but it occurs also on the outer portion, in the sulcus, on the glans, the sheath of the penis, and, in exceptional cases, even in the meatus. In women, the regions invaded in the order of frequency, as pointed out by Unna, are the labia minora, clitoris, labia majora, vestibulum, and carunculæ myrtiformes, perinæum, anal region, genito-crural surfaces, mons veneris, mucosa ani, and vagina.

After slight premonitory subjective sensations, like burning or itching, there appear on those places a few pinhead-sized or somewhat larger vesicles, closely agglomerated, and situated on a reddened, somewhat inflamed base. There is rarely more than one group of efflorescences, and occasionally there is only one solitary vesicle. Edematous swelling is a frequent feature, and may, on the prepuce or the labia minora, be quite considerable. On cutaneous surfaces the evolution and course of the trouble is much of the same character as in facial herpes. On mucous membranes, however, where we meet it so much oftener, the vesicles are very apt to rupture on account of friction or other irritation soon after having developed, and present then small, sharply circumscribed, grayish-white, raw spots. It is in this stage that misapprehension will often lead the patient to the undue use of caustics, whereby suppuration may set in and disguise the real nature of the affection. If left alone or properly taken care of, it usually terminates in the course of a few days, without leaving either scars or an induration of the tissues. But it should not be overlooked that these denuded spots are like so many open doors, ready to admit infecting germs, and that chancreoid or chancre is thus only too easily ingrafted upon a pre-existing genital herpes—and herein lies its great clinical importance. It must also be mentioned that there is at times a slight tenderness or even swelling of the inguinal glands. This should not be overestimated, as there are many persons who, with trifling

local sores, develop an engorgement of neighboring ganglia by sympathetic irritation, whatever that may be, or through an invasion of microbes. Genital herpes is exceedingly prone to relapse, and there are men in whom sexual intercourse is almost inevitably followed by an attack of it, as well as women who suffer from it at each catamenial period. Bergh (*Monatsh. für prakt. Derm.*, 1890), for instance, mentions that eighty per cent of his cases of genital herpes were of menstrual origin.

A long and narrow prepuce seems to form a predisposing factor, and this would favor the explanation that mechanical irritation is a prominent cause of the trouble. Some authors (Hardaway, Doyon, Lydston, and others) bring it in relation to preceding venereal diseases, gonorrhœa or chancres; and this corresponds with Unna's observation, who found prostitutes very frequently affected by it, as well as that of Greenough (*Archives of Dermat.*, 1881), who noticed it in seventeen per cent of all his private cases of venereal diseases. That congestion of the genital organs is an important factor in its production can easily be understood. Those who look upon it as a form of zoster, consider an irritation of nerve branches through compression during the sexual act as the cause of it—an analogon to Baerensprung's explanation of facial herpes, given above. To attribute it, as some would do, to digestive derangements, an "arthritic diathesis," to neurotic disturbances in general, seems somewhat too hypothetical. Though not definitely proved, it appears very plausible that parasites may, after all, have a good deal to do with the disease in question.

Diagnosis.—Insignificant as the nosological character of herpes pro-genitalis may appear, its importance from a diagnostic point of view should not be underrated. If seen in the vesicular stage, very little doubt will arise; but in the excoriated state, and particularly after being irritated, a positive decision as to its nature is often a very difficult task for the physician, besides involving great responsibility. Many a patient, exposing four or five discrete, small, raw spots on his glans or on the prepuce, is firmly assured of the innocent character of the lesions, only to find that from day to day, instead of healing up, those places enlarge, indurate, and are eventually followed by constitutional symptoms of syphilis. In another case, again, the patient is unduly alarmed, a confrontation of the supposed source of contamination is instituted, but in a few days the apparent venereal sore is healed without further consequences. Such experiences—and they are by no means exceptional—will lead the careful physician to be guarded in expressing himself emphatically as to the nature and final outcome of any sore occurring on the genitals, and to reserve judgment until sufficient time has elapsed to clear up any possible doubt. The decisive points in the diagnosis will always be the abrupt appearance, the arrangement of the efflorescences in groups, the benign

acute course, and the tendency to recovery under indifferent treatment. From the initial lesion of syphilis it will be distinguished in that this usually shows a much longer period of incubation, that it is most frequently a solitary sore, which, instead of healing, tends to induration, by its scanty, serous secretion, and by its association with an engorgement of the neighboring inguinal glands. Chancroid differs from herpes by its great destructive tendency, its auto-inoculability (which is always absent in herpes), and the concomitant glandular involvement. As said before, a short reserve of a few days will, as a rule, settle the diagnosis. From zoster it differs by its milder character, by its proneness to periodical recurrence, by the small territory affected, and by the irregular arrangement of the lesions, which are in no wise limited to one side only.

Treatment.—In the management of this affection prophylactic measures are very essential to prevent frequent relapses. Proper hygiene of the parts, strict cleanliness to secure an aseptic field, the separation of opposing surfaces by slightly astringent and antiseptic powders, regulation of the sexual habits, and in some cases circumcision, may prove useful. The methodical use of such drugs as will harden the tender epidermis—for instance, an alcoholic solution of tannic acid, sulphate of zinc, alum, borax, and the like—may be tried for the same purpose. The internal use of arsenic, continued for a long period, is recommended by many authors, and Doyon praises especially the waters of Uriage (Isère).

In treating a single attack of genital herpes, extreme care should be taken not to irritate the affected portions unnecessarily, particularly not to use caustics. Friction, contact with urine, should be avoided; a mild dusting powder containing starch, bismuth, oxide or oleate of zinc, and the separation of the parts by absorbent cotton will answer very well. Vidal recommended very highly a solution of tannic acid in glycerin. I have come to prefer aristol to all other applications; it remains dry for quite a while, is free from any obnoxious odor, is a reliable antiseptic agent, and promotes healing quite distinctly.

HERPES ZOSTER. (JOSEPH ZEISLER.)

Synonyms: Zoster; Zona; Ignis Sacer; Shingles; Ger., Guertelausschlag; Guertelrose.

The principal name is derived from the Greek ζώνη, ζώνη, meaning a belt. The popular term *shingles* is probably a corruption of the Latin word *cingula* (girdle).

Definition.—An acute, typical, inflammatory disease of the skin, characterized by the unilateral appearance of grouped vesicles on a red-denied base, along the course of one or more cutaneous nerves.

Frequency.—Although by no means a rare disease, zoster is far from

being common. Large statistics of the American Dermatological Association, covering a period of many years, show that it forms about 1.15 per cent of all cases of skin disease.

Symptomatology.—The eruption is almost regularly preceded by distinct premonitory signs, consisting mainly in neuralgic pains of variable degree of severity over the area about to be affected, and lasting from a few hours to several days, occasionally even for weeks. Sometimes they are missing entirely, particularly in young children. The pain may be of a diffuse character, or, again, confined to certain points, which correspond anatomically to the underlying nerves and their ramifications. Thus, in the most frequent form of zoster, that on the chest, there may be noted an especially tender point near the spine, where the posterior root of the spinal nerve emanates; a second one in the axillary line, where a division of the nerve trunk in a superficial and a deep branch takes place; and, though less often, a third painful spot near the median line. The pain extending over one side of the thorax may become so severe, in some cases, as to interfere with easy respiration and to suggest a beginning pleurisy.

The cutaneous phenomena make their appearance always in an acute manner. At first there are redness and slight swelling over the diseased area. This is soon followed by the eruption of groups of small papular elevations, which in the course of a few hours are transformed into vesicles of the size of a pinhead to that of a small split pea, closely clustered together, fully distended, and filled with a clear, serous fluid. The vesicles are at first sharply contoured and surrounded by an erythematous halo; further on they may, by peripheral extension, become confluent, so as to form larger bullæ. They have generally little tendency to burst, and do so only accidentally. Occasionally a larger surface may be uniformly studded with these vesicles, but, as a rule, there are several distinct and isolated groups of them, varying in size from a dime to the palm of a hand, of irregular shape, and arranged more or less exactly in the form of a semigirdle when situated on the trunk. In other regions, too, the unilateral distribution of the eruption along the course of one or several cutaneous nerves forms a striking feature. These groups come out successively, the one nearest the spinal region usually appearing first, and followed, in intervals of one or a few days, by others nearer the middle line. But all the vesicles constituting one patch are formed and run their further course contemporaneously. Their contents remain clear for three to four days, then become gradually more turbid, puriform, and by and by dry up, forming brownish crusts, which finally fall off and leave in their places reddish or brownish discolorations. These persist for some time and gradually fade away. In some instances, however, permanent marks may remain, which by their arrangement and distribution

are quite characteristic of the preceding eruption. The time consumed for the completion of the cycle in each individual group is from eight to ten days; but through the successive appearance of fresh crops of ves-



FIG. 20.—Herpes zoster (Piffard.)

icles, when the older ones have almost reached the point of involution, the whole process may last up to four and even six weeks.

The subjective symptoms which accompany the eruption are very variable. While in some cases the preliminary neuralgia ceases with the advent of the cutaneous manifestations, it is more often present during

the whole duration of the disease, and is intensified by a burning and smarting sensation, with which every new crop of lesions is ushered in. Some patients complain very little; others seem to suffer very much, particularly from nightly exacerbations, which may disturb the sleep. Even after the completion of the eruptive stage, there may remain for some weeks, and occasionally even for a long period, disturbances in the sensory function of the affected area. Fever is frequently present with zoster, but is rarely of much consequence.

The type of the disease which has been outlined in the foregoing is not without variations or anomalies. Sometimes the lesions do not develop beyond the papular stage, and desquamate without further evolution—a sort of **abortive zoster**. In other though rare cases all the vesicles become hæmorrhagic; they burst very soon and are transformed into small, very painful ulcerations, which heal only after a good deal of suppuration, and naturally leave scars—**hæmorrhagic zoster**. It must be mentioned here, however, that in every severe case of ordinary zoster there may be a few vesicles containing some blood, but they usually dry up in the ordinary way. In the severest variety the base of the vesicles may become necrotic; pain and fever are then very marked, and cicatrization follows—**zoster gangrænosus**, a very exceptional occurrence. As an unusual complication may be regarded the swelling of some neighboring ganglia—for instance, the axillary glands in cases of thoracic or brachial zoster.

Localization.—The most interesting and characteristic feature of herpes zoster is its localization and distribution with reference to the domain of the different cutaneous nerves. Attention has already been called to its unilateral appearance, the median line forming a more or less sharp demarcation. However, as the finest nerve ramifications often reach somewhat over to the other side, one or two small groups of vesicles may extend beyond that line.

Cases of *double-sided zoster* are extreme rarities. One covering both sides of the face is illustrated in F. Hebra's atlas. Kaposi also observed several cases of bilateral zoster facialis, zoster acromio-brachialis, and even one covering both sacro-femoral and ischiadic regions. Still more unique are observations of two zoster eruptions in anatomically different territories on the same patient, like Fabre's case of zoster on the right side of the chest and on the left hip. Recently George Carpenter (Brit. Journ. of Derm., January, 1892) reported a bilateral, intercostal zoster on even level in a boy of four years.

While many authors designate by special adjectives the more common and typical localizations of zoster, this is done only for the sake of convenience; for the process is essentially the same wherever it occurs, and almost any region may be affected.

By far the most frequent site is the chest—*zoster pectoralis* or *inter-*

costalis; this form may be regarded as the very type of the disease, as its relation to the intercostal nerves and the semigirdle-like arrangement of the efflorescences is most conspicuous. Two or three intercostal spaces are usually affected, and the several groups of vesicles form occasionally by confluence one uninterrupted band. In a case of Wetherill (Philadelphia Med. Times, 1883), the eruption covered the space between the fourth and the tenth rib from the spinal column to the median line. In another case, of Erasmus Wilson, there existed simultaneously in the space between the clavicle and the anal fold five parallel and perfectly isolated bands of zoster. According to my experience, the right side is affected oftener than the left one, and I found it several times combined with an eruption on the arm of the same side—*zoster brachialis*.

The terms *zoster dorso-abdominalis*, *lumbo-inguinalis*, *lumbo-femoralis*, *sacro-ischiadicus*, and *sacro-genitalis* refer to the localization of the disease in those respective regions. Below the knee it is rare to encounter zoster. In the cervical region again it is quite common—*zoster nuchæ seu collaris*—and may extend from the region of the cervical vertebræ toward the clavicle or upward toward the occiput and the auricle.

Of especial interest is the occurrence of zoster in the territory of the fifth nerve, on account of the frequent involvement of the eye—*zoster ophthalmicus*. Through a participation of the ciliary branch and of the long root of the Gasserian ganglion as well as the lachrymal nerve, there may be conjunctivitis, congestion of the ciliary vessels, the eruption of papules, vesicles, and consecutive ulcerations on the cornea and even iritis. Considerable pain is always present, and cicatrization results on the cornea, which may remain anæsthetic. In severe cases, as in the one reported by Wyss, there may follow panophthalmia with all its fatal consequences.

The implication of the frontal branch of the fifth nerve shows the eruption in the supraorbital region and extending through the hair up to the vertex; this form, too, is very painful, and often becomes hæmorrhagic.

Zoster of the face may be complicated by the eruption of groups of ephemeral vesicles on the mucous membranes of the cheek, the palate, and the pharynx of the corresponding side. There is usually severe headache, and M. Singer even observed as a final result the falling out of several teeth and necrosis of the alveolar process.

Unicity versus Recurrence of Zoster.—A very remarkable fact in regard to zoster is that it attacks a person, as a rule, only once during lifetime; exceptions to this are so few and far between that they do not materially affect the generally accepted law. But it must also be remembered that in a disease which by no means can be called common, relapses would by natural consequence be quite rare. To the older cases of Wyss, Rayer,

Singer, Fabre, and others, Kaposi has added a most singular observation of a patient who up to the time of the author's last communication (Viertelj. für Derm. und Syph., 1889) had thirteen distinct attacks of zoster, mostly on the right arm and chest, but three of them in the left cervico-brachial and one in the right sacro-crural region. In four other cases, reported by Kaposi (ibid., p. 561), relapses had occurred several times, but a striking feature in all of them was the transformation of the lesions into gangrenous areas with resulting scars and the development of keloids, besides the more or less symmetrical appearance of the eruption. Three of the patients were women and one a man, but in all of them unmistakable signs of hysteria were noted. These anomalous conditions separate those cases sufficiently from ordinary herpes zoster as to justify the special designation given them by the author—**Zoster atypicus gangrænosus** and **hystericus**.

In a case of Nieden (Mendel's Centralbl., 1882), there were five recurrences of ophthalmic zoster within six years. Tilbury Fox observed a patient who for several years had every summer a recurrent zoster of especially long duration. Similar cases are mentioned by Kopp, Crocker, Hartzell, and others. A close examination of all these cases shows, however, some sort of deviation from the ordinary type, and often a traumatic causation.

Sequelæ.—The termination of the local manifestations does not always indicate a complete restoration in the affected territory. Not only may neuralgic pains persist for some time and become the source of agonizing attacks which deteriorate the patient's health, but in some cases there remain pruritus, hyperæsthesia or complete anæsthesia, and analgesia. Of particular interest is the so-called *anæsthesia dolorosa*, which occasionally follows a zoster; an explanation for this peculiar phenomenon may be found in that pathological changes in the course of the nerve disturb the transmission from the surface to the center, whereby the anæsthesia is produced, while the cause of the pain is located in the sensory root of the spinal column.

A remarkable case of this kind was reported by the writer at the meeting of the American Dermatological Association in September, 1889. After the disappearance of a zoster frontalis there remained on the right side of the forehead such complete anæsthesia that the insertion of a needle deep into the skin caused no pain whatever. At the same time, the patient complained of severe itching and burning in the affected area. This condition persisted for many months, in spite of persevering treatment.

Although zoster is generally attributed to disturbances in the sensory nerves, the strange fact must be recorded that often motor paralysis and muscular atrophy are caused by it. The observations of Tryde, Greenough, Struebing, Voigt, Eulenburg, and others, show that such occur-

rences are not at all rare after facial zoster, and Vernon reported a case of partial paralysis of the oculomotor nerve after zoster ophthalmicus. Paralysis of the arm muscles after zoster brachialis was noted by Schwimmer, Joffroy, Broadbent, and Gibney. Davidsolm saw a case of zoster sacrogenitalis complicated by paralysis of the urinary bladder and delayed defecation. Even trophic disturbances have been observed after zoster, like alopecia and falling out of the teeth, and Kaposi and Donders recorded localized hyperidrosis on the previously affected area.

Pathology.—Since Baerensprung demonstrated, in 1861, based upon previous theoretical suppositions, pathological lesions in the intercostal ganglia, corresponding to the site of the eruption, the relation of herpes zoster to disturbances in the underlying spinal nerves which emanate from those ganglia has been pretty universally admitted. Among the authors who have since added confirmatory evidence may be mentioned Rayer, Weidner, Charcot, E. Wagner, O. Wyss, Sattler, H. Hebra, Kaposi, and many others. Of the cerebral nerves, it is only the fifth in whose domain zoster occurs, and inasmuch as its ramifications are in anatomical connection with the Gasserian ganglion, the analogy to intercostal zoster is quite apparent. Kaposi, Wyss, and Sattler have in several instances found distinct hæmorrhage and consecutive destruction of those ganglia; others have observed the signs of inflammation only. In some cases, however, the ganglia were found perfectly intact, whereas the peripheral nerves themselves were pathologically altered (Daniellsen, Esmarch, Baerensprung, Haight, and Charcot). This is especially noticeable where zoster follows a traumatism; this was first pointed out by Charcot in 1851, and has since been verified by Mitchell, Morehouse, and others. Besnier observed a peculiar case, where a coachman, after falling down from his seat, soon developed a zoster acromialis on the opposite side of the injured shoulder.

Perineuritis and interstitial neuritis, hæmorrhages into the nerve sheaths, the compression of the nerve by tumors (Curschmann and Eisnlohr, Pitres and Vaillard) or by periosteal swellings of the ribs (Dubler), the condition known as perineuritis nodosa, suppurative processes in neighboring tissues (Schwimmer), have all occasionally been observed in connection with zoster.

But even pathological changes in the central nervous organs, the spinal cord, and the brain, seem at times to form the anatomical substratum of the disease; thus, myelitis (Hardy, Weidner), hemiplegia (Duncan, Payne), tetanus (Bloch), have been found associated with zoster; and Kaposi is inclined to look upon the rare cases of bilateral and multiple zoster, relapsing ones and those almost unique instances, following the intoxication with carbon-oxide gas (Leudet, Mougeot), as due to a disturbance of the vasomotory centers.

While the relation of zoster to morbid changes in the nervous system has thus been established beyond a reasonable doubt, it is merely a matter of conjecture in what manner the cutaneous phenomena are produced. The still prevailing theory of Baerensprung, however, tends to show that those nerve elements whose chief function is the nutrition of the skin—i. e., the so-called trophic nerves—are primarily to blame. Whether these nerve-filaments are identical with the vasomotory fibers remains yet to be shown. The alteration of the supposed trophic nerves is then followed by a sort of localized cell necrosis in the rete Malpighii, which acts as the cause of the succeeding inflammatory reaction in the cutis (Lesser).

L. Pfeiffer, in a recent monograph on zoster (Jena, 1890), tries to discredit the theory of the nervous origin of the disease, and to explain its peculiar localization by way of the distribution of the cutaneous arteries. According to his views, micro-organisms are the prime cause of the trouble, and their invasion into and clogging of the finest capillaries of the skin give rise to the herpetic inflammation. In one of the latest publications on the subject, Wasielewski (Jena, 1892) develops the hypothesis of the arterial origin of zoster still further, in a very interesting manner, without bringing out, however, any new or more convincing proofs than his predecessor.

The idea of the parasitic nature of zoster is not without adherents among those who still emphasize the nerve influence. Weigert and Neisser, for instance, assume that primarily there is produced by the nervous alteration a superficial destruction of tissue, which favors the intrusion of infecting germs. So far, however, while different forms of microbes have been found in zoster vesicles, no specific organisms have been isolated.

Morbid Anatomy.—This has been studied by Biesiadecki, Robinson, Haight, Lesser, Kopp, and others. The three last-named authors agree in that there is at first a nutritive disturbance in the Malpighian layer, and that the inflammation in the papillary layer is only consecutive. Early in the process an enormous proliferation of the epithelial cells can be noticed; they may enlarge up to five times their normal size, and they also increase in number by cell-division. Then small cavities are formed, containing degenerated epithelia, and separated from each other by flattened epithelial cells. Through confluence of these vacuoles, after rupture of their partitions vesicles are formed. The roof wall of these is formed by the horny layer, to the inner surface of which there are still adhering enlarged and degenerated epithelia; their base is the papillary body, which in some places reaches into the vesicular cavity quite bare, while in others it is still covered by a thin layer of flattened epithelial cells, corresponding to Rayet's pseudo-membrane.

These results are antagonistic to former observations, which placed the primary morbid changes into the papillary layer.

On the nerves themselves, Robinson has shown a perineuritis, characterized by round-cell infiltration within and around the neurilemma.

Etiology.—Zoster affects all ages, but is somewhat more frequently found in young subjects. Of 255 cases serving a statistical examination by Greenough, 143, or over five ninths, were under twenty years old. In infants it is very rare; Lomer (*Centralblatt für Gynækol.*, 1889) reports the occurrence of a zoster abdomino-femoralis in an infant four days old; there was no cause distinguishable, and the vesicles required three weeks to dry up. Bohn mentions two other cases in babies. Sex has little influence, though there seems to be a slight preponderance on the side of the male.

Although many authors, especially Kaposi, claim that certain seasons are productive of a distinct increase in the number of zoster cases, particularly the months of March, April, October, and November, when pneumonia and pleurisy are prevalent, an impartial study of large tables, like those of the Hôpital St. Louis, in Paris, covering 298 cases during ten years, shows that the numerical differences at various periods of the year are not sufficiently striking to establish anything like a rule. It can not, however, be denied that zoster frequently occurs in small epidemics, as was shown by Kaposi (*Wiener med. Wochenschr.*, 1889). Zimmerlin also (*Corresp. f. Schweizer Aerzte*, 1883) records an epidemic of thirty cases occurring in a hospital, and Erb describes two cases, in each of which mother and daughter were simultaneously affected. Landouzy favors very much the theory of infection; he differentiates symptomatic zoster, due to local causes, from idiopathic zoster or zosterian fever, as he calls it, which he places among the infectious diseases. The first to proclaim the infectious character of zoster was Rohé (*American Arch. of Derm.*, 1877); he bases his view upon the cyclic course of the disease, and its tendency toward recovery, on the preceding prodromata, on that it attacks persons usually only once during lifetime, on the impossibility to abort it, and on its occurrence in the form of epidemics. Pfeiffer and others, as mentioned above, have gone so far as to explain the infectiousness of zoster through special parasites. While this hypothesis has surely some strong points in its favor, it covers by no means the many isolated cases and those of traumatic origin.

Exposure to cold is considered as a frequent cause of zoster, in a similar way as it may produce neuralgia; thus Struebing observed a case in which exposure of the face to a strong draught was followed by a herpetic eruption on the ear, the cheek, jaw, front and back of the neck; on the seventh day the affected side became paralyzed.

Of great interest is the observation that zoster follows at times the

internal administration of arsenic. J. Hutchinson pointed this out as early as 1868; and though Juliusberger, Fabre, White, Kaposi, and others deny any etiological relation, and consider those occurrences only as casual coincidences, Bulkley, Epstein, Broadbent, Perroud, Crocker, Neilsen, and many others have piled up sufficient evidence in favor of a causal connection. I have myself noted this occurrence so often as to thoroughly convince myself of its more than accidental meaning; I never saw, however, a zoster during arsenical treatment of psoriasis, whereas it followed in most cases of lichen planus so treated. It would be strange, indeed, that the frequent symbiosis of a fairly uncommon skin disease like zoster, with a still rarer trouble, should be merely a coincidence. While the eruption is sometimes quite typical and covering a large area, there is in the majority of instances only one or two small patches present. An explanation for this peculiar action of arsenic lies probably in its undoubted influence upon the peripheral nerve terminations.

The traumatic origin of zoster has already been alluded to. All sorts of local injuries—burns, cuts, contusions, and the like—may bring on the eruption. Liveing and Koebner recorded it after the application of the galvanic current. Extraction of a tooth, various surgical operations, even vaccination, have at times produced it. Touton's case of a femoral zoster after an intramuscular injection of salicylate of mercury (*Arch. für Derm. und Syph.*, 1889) probably belongs to this category.

That distinct pathological affections of the nervous system frequently cause the disease, has been shown in the preceding chapter; but even functional disturbances in the nervous sphere (hysteria) seem occasionally to produce it. If we finally refer to such rather ill-defined factors like moral depression or mental excitement, different dyscrasias and cachexia (tuberculosis, cancer), and reflex irritation from visceral organs, we have a long and varied list of causes, but still considerable obscurity surrounding the etiology of zoster.

Diagnosis.—The characteristics of herpes zoster are usually so marked that little difficulty can exist in recognizing it. Its unilateral distribution along the course of well-known cutaneous nerves, the successive appearance of groups of vesicles, their cyclic course, and the concomitant neuralgia, will easily establish the diagnosis. From eczema it is readily differentiated by the larger size of its vesicles and their tendency to persist as such, whereas in the former they burst very soon and give rise to the characteristic oozing. Its difference from herpes simplex has been mentioned in the article devoted to this disease.

Prognosis.—As can be seen from the symptomatology, the prognosis of zoster is almost always favorable. Care should be taken in pronouncing upon the probable duration of the trouble, as the successive eruption of new patches of vesicles may unduly prolong it. It must also be kept

in mind, that after the termination of the cutaneous phenomena there often remain sensory and motor disturbances. In ophthalmic zoster, particularly, the prognosis should be very guarded; and in the hæmorrhagic and necrotic forms the resulting cicatrization should not be lost sight of.

Treatment.—In a self-limited disease like zoster, treatment will naturally be unable to materially modify its course. But as the striking appearance of the local lesions and the accompanying subjective complaints will, as a rule, bring the patient to his medical adviser, the indications for a rational treatment will be to combat the pains and to protect the vesicular eruption from any sort of irritation that might disturb its speedy desiccation. Attempts to abort the disease, even in the beginning, are usually futile. For internal use a host of remedies have been recommended. Of those which seem at times to exert a favorable influence may be mentioned salicylate of soda, sulphate of quinine, and the more modern antipyretics and analgesics, like antipyrine, antifebrin, and phenacetine. Chloral, bromide of potassium or sodium, and opiates may be required to relieve the pain. A. Thompson and Bulkley claim to have mitigated the course of the disease by the early administration of phosphide of zinc, in doses of two centigrammes, particularly in the beginning. Jamieson favors a combination of equal parts of tincture of nux vomica and tincture of gelsemium, of which twenty to forty drops are given daily. When the neuralgic pains become severe, subcutaneous injections of morphia or of cocaine may be resorted to. The use of the galvanic current for the same purpose is highly praised by many authors; one or two sittings are given daily for about ten minutes; the positive pole is placed near the spine, where the affected intercostal nerve is supposed to emanate, while the negative pole, best in the shape of a roller electrode, is gently moved along the eruption.

The local treatment ought to be so arranged as to protect the vesicles as far as possible against being ruptured. All sorts of fomentations or moist poultices are therefore better avoided, and even ointments are not desirable in the beginning. The free and repeated use of a mild dusting powder, composed of amylum, talcum, zinc oxide or stearate, and the like, to which may be added a little camphor and opium, covered by a layer of absorbent cotton, and secured by a light, well-fitting bandage, answers, as a rule, very well. This may be advantageously preceded by painting a ten-per-cent solution of ichthyol over the vesicles, to promote their desiccation. A number of authors recommend the application of plain or medicated collodion, either directly to the eruption or after spreading over it a thin wisp of absorbent cotton; others, however, warn against this method, as its action is at times quite irritating. Duhring advocates the use of a five to ten per cent solution of *grindelia robusta* in water as

a local dressing. All sorts of lotions, of which a great many have been suggested by different writers, have, however, the disadvantage of requiring a frequently renewed application, and of exerting a more or less macerating action upon the vesicles. Brocq's plan of treatment consists in carefully opening each individual blister, washing the surface with a mild antiseptic solution, and covering it with a paste containing oxide of zinc and boric acid.

When the vesicles either spontaneously or accidentally have burst, when erosions or superficial ulcerations are present, the use of mild ointments will usually be called for, as a dry dressing, and even moist applications would naturally adhere to the raw spots and thus occasion much discomfort. The zinc-ichthyol paste mentioned in the article on herpes simplex, borated or carbolized vaseline, a three to five per cent aristol salve, or a mild cocaine ointment will then be in order. If torpid ulcers result from hæmorrhagic or necrotic zoster, it is well to regularly clean them with an antiseptic solution and to apply an ointment containing two per cent of nitrate of silver and about five of Peruvian balsam.

The treatment of ophthalmic zoster may require all the skill and attention of the oculist to prevent untoward consequences.

The sensory and motory disturbances remaining after the vanishing of the cutaneous lesions will sometimes baffle the most experienced dermatologist. In such cases galvanic electricity is our supreme remedial agent. Kaposi has had good success from the use of Fowler's solution of arsenic in gradually increasing doses. Locally, the pruritus and pain may be relieved by preparations of menthol, cocaine, chloroform, and belladonna. In extremely obstinate cases the application of the actual cautery near the seat of the diseased ganglion, or where the nerve-branches emerge into the cutis, may serve as a last resort.

HYDROA. (JOSEPH ZEISLER.)

Derivation, ὕδωρ, water.

It is difficult at the present time to give a definition of this term, as it has been used for the most varied affections, and is applied to-day in some quarters for diseases which are classed by the majority of dermatologists under other definite heads. The three varieties established by Bazin—*hydroa vésiculeux*, *hydroa bulleux*, and *hydroa vacciniforme*—can not be maintained any longer, as the first has been acknowledged by the author himself to be identical with erythema and herpes iris, and the second is only a phase of dermatitis herpetiformis (Dühring). Why Crocker chooses to discard this designation for hydroa herpetiforme is not quite clear, as this only adds to the already existing confusion as re-

gards the nomenclature of that disease. The third of Bazin's varieties is identical with what Hutchinson has described as recurrent summer eruption, and what Unna terms *hydroa puerorum*. According to Crocker's description, this disease usually begins in early life, and occurs principally in boys. The eruption affects chiefly the exposed parts, is generally preceded by burning or pain, and by some general premonitory symptoms. Red spots appear, on which vesicles develop shortly afterward singly or in groups. After their desiccation there frequently remain slightly depressed scars, which resemble very much those following smallpox. There is little itching present; the whole attack may consume from two to three weeks. The patient is liable to recurrences during the warm season, the influence of the sun and wind seeming to favor them. When the patient grows up the trouble seems to cease spontaneously. Little is known about the etiology and pathology of this disease. The treatment is simply symptomatic.

PEMPHIGUS. (JOSEPH ZEISLER.)

Derivation, *πέμφιξ*, a blister.

General Remarks.—It is no easy matter at the present time to give a strict and comprehensive definition of what should be understood by the term *pemphigus*. It was used in former times to designate almost any affection of the skin in which bullæ formed a more or less prominent feature, and one of the older writers—H. Martius—enumerated no less than ninety-seven varieties of pemphigus. Very slowly and gradually began a process of cleaning up the sorely neglected stall of Augeas, and the last ten years particularly saw a very revolution instituted which fairly shook the foundations of what had seemed to be a solid structure. Commenced in our own country by Duhring, and followed very vigorously in France under the leadership of Brocq, the revision of the bullous, vesicular, and erythematous affections resulted in the establishment of a new dermatosis—*dermatitis herpetiformis* (Duhring)—which has been made to comprise among many other forms a good deal that previously had been considered as belonging to pemphigus. The vigorous fight to secure for that disease an independent position in the system of skin diseases is by no means over, for many dermatologists, among them men like Kaposi, simply ignore it; and whether much is gained by separating different forms of pemphigoid eruptions from pemphigus and simply shifting them over to that all-embracing disease of Duhring seems doubtful as long as the pathology and etiology of those diseases are not established upon a more substantial basis. But this is not the place to discuss that question, and the reader is referred for details to the special chapter devoted to it.

The majority of modern writers are, however, agreed upon the necessity of confining the term of pemphigus as far as possible to a nosological entity, instead of applying it in a slipshod manner to a mere lesion on the skin. Accordingly, there is no such thing as pemphigus syphiliticus, but we shall have to speak of a syphiloderma bullosum; nor is there a pemphigus leprosus, but simply a bullous leproderma; we do not recognize a pemphigus after the ingestion of iodide of potassium (Feulard, Hallopeau), after the use of copaiba balsam (Hardy), or other drugs, or after the external application of vesicatories, but refer these eruptions to dermatitis medicamentosa. Neither could a bullous eruption following vaccination be considered as pemphigus. The existence of a so-called acute pemphigus in the adult, and of a contagious form of that disease in the newborn, is generally conceded, but manifestly these forms have only the cutaneous lesion in common with true pemphigus, and differ in many respects from it; and if they are here treated under the same heading, we do so only provisionally until their place in the system is definitely established. Under the presently existing difficulties we may, then, with reference to the foregoing reserve, establish the following:

Definition.—Pemphigus is an eminently chronic disease of the skin, characterized by the successive eruption of variously sized bullæ, without any primary inflammation, running an indefinite, atypical course, and often terminating fatally.

Frequency.—Pemphigus is a very rare disease. The statistical reports of the American Dermatological Association for the years 1878 to 1887 mention a hundred and eighty-three cases of it out of a total of 123,746 of cutaneous diseases, which shows a proportion of about 1.5 *pro mille*. Kaposi has seen a hundred and eighty-two cases out of fifty thousand cases of skin diseases, which makes 4.1 *pro mille*. Were we to exclude, however, all such cases which in modern times would be considered as doubtful, the proportion would appear much smaller. I have myself within the last nine years seen only four cases of undoubted pemphigus out of over six thousand cases of skin affections.

Varieties.—It is not our intention to enumerate or describe the many varieties that have been established by former authors; to some, allusion will be made in the following: A few, like pemphigus pruriginosus and pemphigus circinatus, are at present included under dermatitis herpetiformis. But we consider it desirable, for the purpose of clinical recognition, to emphasize three distinct forms of the disease, namely, *pemphigus vulgaris*, *pemphigus foliaceus*, and *pemphigus vegetans*.

A. PEMPHIGUS VULGARIS.

Symptomatology.—The eruption is sometimes preceded by slight febrile symptoms, general *malaise*, chilliness, nausea and vomiting, rise of

PLATE II.



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PEMPHIGUS VULGARIS (Chatelain).

the temperature by two or three degrees, and accelerated pulse; in other cases the disease begins very insidiously, without any forebodings and even without the knowledge of the patient, who may otherwise appear to be in perfect health. In typical cases the integument to be affected shows no alteration, no sign of inflammation; some authors, however, state that erythematous or urticarial lesions occasionally precede the formation of the blebs.

The characteristic lesions of pemphigus are developed almost abruptly, and consist in well-formed, fully distended, tense blebs of roundish or oval outline, varying in size from a small pea to a goose egg, containing a clear, transparent fluid, and surrounded by apparently normal skin. There may be only very few of them—two or three—or, again, a hundred and more may be present at a time. They occur on almost any part of the body, without much symmetry. Often beginning on the front of the thorax, they seem to favor such places as are protected by the clothing; but when abundant are equally found on the face and hairy scalp, and are then arranged more or less symmetrically. They may be widely disseminated, or, again, so closely grouped as to become confluent. They appear in successive crops, a few or many rising every day or at longer intervals. Each individual bleb undergoes a fairly typical evolution; it may retain its original size, or may rapidly enlarge; its contents, at first limpid, in rare cases showing a slight admixture of blood (*pemphigus hæmorrhagicus*), change in a day or two to a puriform fluid; at this stage the bleb may be surrounded by a narrow erythematous band. Gradually the exudate is absorbed; it desiccates, and forms with the dried bleb wall a thin, brownish crust. If the bleb has ruptured, the denuded surface shows a serous or slightly bloody secretion, which soon dries up. After a few more days the scab falls off, and the site of the former bullæ is occupied by a young, rosy epidermis, which for some time may remain pigmented. Where many blebs and crusts are closely clustered together, and purulent exudate is retained beneath the scabs, there may be slight œdema produced, or there may be lymphangitis and engorgement of the neighboring ganglia.

The successive appearance of new crops of bullæ is usually accompanied by some pyrexia, which, however, is rarely of much consequence. The concomitant subjective symptoms may consist in a slight burning and itching sensation, or a feeling of pain and tension, where numerous blebs, crusts, and excoriations are present; consequently there may be loss of sleep, anorexia, and general prostration. Improvement is declared by a remission of the fever, by the appearance of new bullæ in smaller numbers and at longer intervals, until finally they cease entirely to show up, the skin assumes its normal appearance, and the patient is apparently restored.

The whole attack thus described may cover a period from two to six months, and in rare cases the disease may then be extinct forever. But more often, after pauses of several months, or even a year, relapses may take place which in some cases may eventually yet lead to recovery, but in others follow each other so closely as to show no remission, and to lead to a fatal termination through some intercurrent disease.

There may be many deviations from the type which we endeavored to sketch in the foregoing. The absence of fever, a small number of blebs, short duration of the different eruptive attacks, may constitute a *pemphigus benignus*. There are even cases recorded where one bleb only exists at a time, even when the process lasts for years—*pemphigus solitarius*. A still rarer occurrence is the eruption of single blebs on places where the skin is cold and cyanotic, as the fingers, toes, the nose, and auricle. The recovery of the epidermis at the site of the bullæ does not always take place in a smooth way, and then the disease usually assumes a dangerous aspect. The corium may become covered with fibrinous exudate—*pemphigus crouposus*; or there ensues a superficial necrosis—*pemphigus diphthericus*; or deep sloughing may take place—*pemphigus gangrenosus*; or peculiar vegetations may develop—*pemphigus vegetans*—a form which will be separately considered later on. In some cases pemphigus vulgaris may gradually turn into that malignant type known as *pemphigus foliaceus*. What is usually termed by authors *pemphigus pruriginosus*, a form in which the itching is so intense that a bleb is rarely allowed to develop, because its base has been excoriated by scratching, where all the secondary lesions, due to long-continued pruritus, entirely hide the pemphigoid character of the essential trouble, may to-day better be classed with Duhring's dermatitis herpetiformis. The same applies to the varieties called *pemphigus circinatus* and *pemphigus serpiginosus*, where around an old central bulla new ones spring up, which, after the desiccation of the former, are arranged in circular shape, or, later on, in serpiginous lines.

Pemphigus in all its forms may attack not only the skin, but also the mucous membranes; but as this location is more characteristic of pemphigus foliaceus, it will be considered under that heading, to avoid repetition.

After recovery from pemphigus, the formation of numerous milium corpuscles has been observed by Baerensprung, Hebra, and Kaposi; they were arranged in groups, persisted for several months, and then became detached.

Pemphigus Acutus.—Although many authors mention and describe acute attacks of pemphigus, it is by no means finally settled whether this form is etiologically and pathologically identical with ordinary chronic pemphigus. We are far from subscribing to the older Hebra's teaching, who considered those cases as instances of mistaken diagnoses; we dis-

tinctly recognize the occurrence of acute bullous eruptions, closely resembling in their clinical aspect the well-known pemphigus vulgaris, but we hold that, until more observations have been made and their identity with the latter proved beyond doubt, they had better be termed unprejudicedly as *febris bullosa*.

As in other eruptive fevers, there is usually a typical prodromal stage, lasting one or two days, characterized by the well-known symptoms peculiar to that period, and often by distinct chills. Itching and localized redness precede, as a rule, the eruption of blebs, which in most respects correspond to the type described before. The lesions are, however, on the whole somewhat smaller, from pea to hazel-nut size, and rarely assume considerable dimensions; they are mostly surrounded by an erythematous halo; they appear very copiously in successive crops within a few days, and undergo, as a rule, an undisturbed involution. The mucous membranes are frequently invaded.

The whole process is during the eruptive stage accompanied by fever, which abates with the desiccation of the blebs and lasts from one to four weeks, and in rare instances somewhat longer. While usually terminating in perfect recovery, several instances are recorded where the high fever, complicating albuminuria, pulmonary affections, a typhoid state, and inanition, on account of dysphagia due to lesions in the mouth and throat, have caused the death of the patient. Some of these have been termed, on account of their rapid and fatal termination, *pemphigus malignus*. Cases of this so-called acute pemphigus have been described by Auspitz (Syst. d. Hautkr., 1881), Horand (Ann. de Derm. und Syph., iv, 6), Purjesz (Arch. für klin. Med., 1876), Barthel (St. Petersburg. med. Wochenschr., 1876), Senator (D. med. Wochenschr., 1886), Allen (Jour. of Cut. and Gen.-Urin. Dis., 1888), Ravogli (Cincinnati Lancet-Clinic, 1889), and several others. A careful perusal of these observations shows so little uniformity and congruity as to make it difficult, under our present state of knowledge, to class them together as one group.

There is one form of acute pemphigoid eruption which seems to be well defined, and which is usually designated as

Pemphigus Acutus Contagiosus Neonatorum.—It must be stated at the outset that this form of bullous eruption has nothing to do with congenital syphilis. It affects newborn children, occurs in distinct epidemics, and is undoubtedly contagious. Series of cases have been noted to occur in the practice of one midwife. After a short prodromal stage, and with a remission of the fever, blebs appear abruptly on a reddened basis, which soon disappears. Several outbreaks follow each other, resulting in rapid recovery. No special predilection, as regards the site of the lesions, can be noted; even the palms and soles and mucous membranes may occasionally be invaded. In grave cases the bullæ burst,

ulceration follows and may develop into gangrene, which usually leads to death. Such epidemics have been described, among others, by Moldenhauer (Arch. für Gynaekol., 1874), Padova (Viertelj. für Derm. und Syph., 1877), Zechmeister (Muenchen. med. Woch., 1887), Wichmann (Viertelj. für Derm. und Syph., 1888), Shukowski (ibid., 1891), and Almquist (Zeitschr. für Hygiene, x, 2). This latter author succeeded in isolating from the bullous contents cocci, which resembled very much the *staphylococcus aureus*, and he was successful in producing by self-inoculation bullous lesions. While mainly occurring in infants, the disease is frequently transmitted to adults also, in whom, however, it assumes a somewhat milder type. Pontoppidan (Viertelj. für Derm. und Syph., 1885) and Faber (Monatsh. für prakt. Derm., 1890) have expressed it as their opinion that many of those cases are identical with impetigo contagiosa, as it is clearly this affection which is observed in the adult, while the same cause in infants, owing to anatomical differences, produces a different picture—that of the bullous eruption. Since the true carrier of contagion has not been demonstrated as yet, either for impetigo contagiosa or for the above-mentioned pemphigoid eruption, the question of their identity can not be decided at present.

A form of contagious bullous eruption occurring in the tropics, very similar to the one just mentioned, has been described by P. Manson (Trans. Hong-Kong Med. Soc., 1889).

B. PEMPHIGUS FOLIACEUS.

Symptomatology.—The distinguishing feature of this form of pemphigus is the flaccid condition of the bullæ, the exfoliation of the epidermis around the same, and the lack of regenerative action at the base of the lesions. This condition may supervene after a longer or shorter duration of ordinary pemphigus, or it may be present from the beginning of the process. The blebs are never tense, but quite flabby; their contents soon become opaque, purulent, and settle at the most dependent part of the bullæ; in some places the fluid is so scanty that no elevation of the epidermis is caused, but this looks somewhat folded, and in the attempt to raise it, or accidentally, it may be torn off quite a distance. The blebs burst very soon, and this is followed by a peripherally progressing detachment of the surrounding epidermis, in the form of lamellæ—an aspect which has been compared to that of flaky pie-crust (Ger., *Butterteig*, Fr., *gâteau feuilleté*) or dead leaves. It was this condition which prompted the original describer, Cazenave, to select the name *pemphigus foliaceus*. The denuded corium remains raw, oozing as in eczema rubrum; the dried-up secretion forms thin, moist crusts. Here and there a sort of epidermis forms for a time, but it soon succumbs to renewed exudation underneath, or is accidentally rubbed off. In the

course of a few months, or after several years' duration, the process has invaded the whole integument; there is hardly a sound spot to be found anywhere. The patient is in a deplorable state; excoriations, fissures, oozing or suppurating places showing the shape of former blebs as circular or segmented lines, crusts, and scales, some flaccid bullæ are irregularly distributed all over the body; some large areas may look as if severely burned. The hair becomes brittle and easily falls out; the eyes look inflamed, particularly when the lids become everted. The nails get thinned and friable; furuncles and foul abscesses form in different parts of the body. There is a bad odor emanating from the patient. His sufferings and pain, the impossibility to remain comfortable in any position, sleeplessness, and a sort of adynamic fever, frequent disturbances from part of the digestive organs, result in a marked emaciation and deterioration of the general health, which sooner or later lead to a fatal issue.

Severe complications may arise when the mucous membranes become affected. In the mouth and throat, in rare cases the nostrils and vagina, evanescent bullæ may appear, which soon become macerated, and leave in their place reddish or dirty grayish diphtheritic patches; if seated on the epiglottis or in the larynx they may easily cause dangerous symptoms of suffocation. Such lesions are occasionally observed in ordinary pemphigus, but here the epithelium is usually soon regenerated, and only temporary inconvenience is caused thereby; but when they follow a course analogous to that noticed on the skin in pemphigus foliaceus, large patches may become raw, dry as if varnished, reddish-brown; deglutition becomes almost impossible; even the respiration is impeded; the speech is reduced to a mere whisper, and all hope of recovery is then gone.

In exceedingly rare cases the conjunctivæ may be invaded, and this localization has for some time invited the special attention of ophthalmologists, as the question of the identity of the process with so-called "essential shrinking" or xerosis of the conjunctivæ, is by no means easily decided. Malcolm Morris and H. L. Roberts have recently (*British Journal of Dermatology*, 1889) collected from literature and tabulated twenty-eight cases of this trouble, in sixteen of which there was originally pemphigus vulgaris or foliaceus of the skin, while in four the disease began on different mucous membranes, and in eight commenced on the eye. The almost inevitable result is blindness, on account of the atrophy of the conjunctivæ, and consequent adhesions of the same to the eyeball.

The fact that pemphigus lesions may, although rarely, occur on different mucous membranes long before any eruption on the skin, is very important in diagnostic respects, and usually foreshadows the grave character of the disease.

C. PEMPHIGUS VEGETANS.

It has been known for a long time that occasionally papillary vegetations may occur during the course of pemphigus, in a similar way as they are observed in syphilis, in so-called cases of frambœsia, and in impetigo herpetiformis. But only since Neumann gave his masterly presentation of the clinical and histological details of that form (*Viertelj. für Derm. und Syph.*, 1886) has special attention been directed to it; and the striking uniformity noticeable in almost all cases reported since by Crocker, C. Mueller, Szadek, Marianelli, Hyde, and others, justify the adoption of the above name to designate a distinct variety of pemphigus. To select for it, as Unna and C. Mueller propose (*Monatsh. für prakt. Derm.*, 1890), the term *erythema bullosum vegetans*, is neither just to the original describer, nor does this name express the clinical peculiarities or its pathology any better or more clearly than Neumann's.

Symptomatology.—In almost all the few cases recorded so far the disease made its inception on some mucous membrane, on the lips, in the mouth, or throat. After a shorter or longer interval a bullous eruption appears on the general integument which at first shows little deviation from the type described as pemphigus vulgaris. Very soon, however, the eruption develops a tendency to peripheral concentric progression, the central bulla, while itself beginning to crust over, being surrounded by fresh vesicles and blebs. Instead of healing over, the base of the lesions soon becomes covered with fungoid, wartlike vegetations, which are caused by a proliferation of the epidermis and by excrescences of the papillæ of the skin. They gradually enlarge to massive plaques, which are soft, moist, or occasionally dry, of a reddish-brown color, secreting a scanty serous or some purulent, offensive fluid, and may on the surface become necrotic. These condylomatous growths are most apt to form on parts where the skin is delicate and exposed to friction and moisture, as the genito-crural surfaces, the axillæ, near the anus, and around the mouth and nose. In favorable cases the central portion of the plaques may get pale, flatten down, and cicatrize, leaving a brown pigmentation surrounded by serpiginous vesicular bands; but, as a rule, the disease leads very rapidly to a fatal termination, rarely lasting over a few months, on account of the general depression or some complication on part of the kidneys or the lungs.

It is very important to recognize this form, on account of the possibility of confounding it with syphilis. The first few cases were, in fact, diagnosed and described as forms of syphilitic frambœsia.

Pathology.—The work of dermatologists in the last few years, whose chief result has been to more sharply confine the limits of true pemphigus from a clinical standpoint, has unfortunately helped very little to

clear up the darkness that has all along surrounded the pathology of the disease.

In accordance with the definition and the description of the chief varieties given above, we fail to see in pemphigus—as many still do—a primary inflammation of the skin, but we rather favor the explanation of Auspitz, given in his *System of Skin Diseases* (Vienna, 1881). This author considers the formation of the bullæ as due to a rapid destruction of the youngest epidermal stratum—the prickle cell layer—induced by a peculiar cachectic condition of the epithelium, and therefore calls the process *acantholysis*. He separates it from the inflammatory bullæ in which the cells of the Malpighian layer swell up individually by the intrusion of serum, then burst, forming first small vacuolæ, and only gradually developing into larger blebs. In pemphigus there is, indeed, no real clinical sign of inflammation. Redness is often absent, or, if present, can be looked upon as produced by collateral fluxion or by the secondary invasion of microbes. The liquid contents of the bullæ have been subjected by various authors to minute chemical and microscopical examinations in the hope of finding in it the *materies peccans*, but their results have been either conflicting or not sufficiently uniform to allow us to draw safe conclusions as to the nature of pemphigus. Serum surely forms the chief part of the fluid; accordingly, the reaction is either neutral or slightly alkaline. Free ammonia has been found in it by Bamberger (*Wuerzb. med. Woch.*, 1860), as well as in the blood and urine, though the latter had an acid reaction; this was confirmed by Beyerlein. Jarisch and others, again, found urea in it, but no ammonia; still others found leucin and tyrosin, free acetic acid, phosphates, chlorates, cholesterin, and crystals of uric acid. Quite significant are the more recent observations of Jarisch and Robin, who found in the serous fluid fatty substances containing phosphorus; and the latter author explains this as the result of decomposition of nerve elements. It is natural that the contents will vary considerably in their make-up according to the duration of the bleb. When this is fresh, very few cellular elements will be found in it; when it becomes turbid, pus cells, isolated blood-corpuscles, and all sorts of bacteria may be found in it.

It is very doubtful whether some pathological process in the kidneys has anything to do with pemphigus; careful chemical analyses of the urine have, at least so far, shown nothing pathognomonic, the above-mentioned results of Bamberger excepted. Nor has it been possible as yet to demonstrate in the blood a striking deviation from the normal composition. A diminution of the blood-corpuscles has been noted, but this may simply be due to the general cachexia. An increase in the eosinophile cells has also been observed recently, but the same has been noticed

likewise in many other dermatoses. The relation of pemphigus to alterations in the nervous sphere will be mentioned below.

Morbid Anatomy.—Most observers agree with Haight, and emphasize the very superficial seat of the bullæ, its roof consisting of the upper horny layers only, from the under surface of which epidermal prolongations, detached from the orifice of the follicles, may depend in the form of stalactites. The base is formed by the rete cells, which by the intruding fluid are stretched out into long meshes, the trabeculæ of which soon rupture, so that one single cavity results. The papillæ are infiltrated with serum, and show large lacunæ.

Crocker differs from this, and finds that the bulla is not quite superficial, and that the roof is formed by the horny layer and about two thirds of the rete.

Etiology.—What has been said to characterize the state of our knowledge of the pathology of pemphigus holds equally as well concerning its etiology. Personal close observation of a number of cases, and the perusal of the numerous exhaustive descriptions of well-recorded examples of the disease, will fail to bring out anything like a uniform cause, and as a rule there is not even as much as a hint as to its pathogenesis. A proper appreciation of the etiology of individual cases recorded is made still more difficult, as much that is described under the name of pemphigus can not be to-day considered as true instances of the disease. Occupation, mode of living, climate, the seasons, nationality, seem to exercise absolutely no influence. Sex does not seem to make much difference either, though Kaposi states from his large material that three fourths of the whole number were men. Were we to accept the form described above as pemphigus neonatorum as true pemphigus, we should find that children are quite predisposed to it. Apart from this, it can be noticed that the disease may occur at almost any age. There are a few rare instances known where heredity formed a determining factor; thus, Kaposi observed the case of a young man of twenty-two, who had suffered from pemphigus since his infancy. He asserted that his mother, sister, an uncle and half his children, had the same disease.

It may be mentioned, in this connection, that a hereditary predisposition to the formation of bullæ on the skin from the slightest traumatism has been observed by several authors. Carl Blumer (*Arch. für Derm. und Syph. Erg.* II., ii, 1892), who made a very careful study of the question, found that trouble in sixteen members of one and the same family, eleven male and five female. He designates it as *epidermolysis bullosa hereditaria*, and looks upon it as an analogon to hæmophilia. Goldscheider, Valentine, Koebner, and F. Hebra have made similar observations.

The rather antiquated idea that some poisonous substance contained

in the blood is eliminated, instead of through the kidneys, by the skin, is based on very hypothetical grounds.

There is a good deal of evidence to show the relation of pemphigus to affections in the nervous sphere, and, at least for some cases, the trophoneurotic character of the process is quite apparent. This is particularly noticeable where pemphigus followed directly after herpes zoster, as has been observed by Moers and by Schwimmer. Traumatism causing injuries to peripheral nerves and to the central nervous organs has been repeatedly the cause of the disease. Kopp found in one such case numerous hæmorrhages in the spinal cord. Chvostek, Déjerine, Brissaud, Friedreich, Gaillard, Weir Mitchell, Morehouse, Keen, and Charcot have made similar observations concerning injuries to the peripheral nerves, the spinal cord, and the brain. Likewise, pemphigus has been found associated with an acute spinal meningitis, cerebro-spinal meningitis, and chronic myelitis (Leloir, Ferraro). Very significant is the much-quoted case of Jarisch, considered by many as true pemphigus, in which a bullous eruption on the upper half of the body was proved (post-mortem) to have been associated with distinct morbid changes in the spinal cord, from the third cervical down to the eighth dorsal vertebra. Schwimmer and Babes found sclerosis of the posterior spinal roots and of Goll's columns in two cases of pemphigus hæmorrhagicus and foliaceus. Sirski found in the spinal cord an increase of the connective tissue, atrophy of the nerve cells, and pigmentary degeneration of the same. Stefanini observed in a case of pemphigus foliaceus alterations in the sympathetic nerve, consisting in an infiltration of fatty globules and numerous leucocytes in the capsule of the nerve cells. Petrini (Second Int. Derm. Cong., Vienna, 1892) made careful studies of three cases of pemphigus, whereby he found no essential lesions in the spinal cord, but, what seemed to him most characteristic, an atrophy of the peripheral cutaneous nerves. This is a confirmation of similar observations made by Déjerine, Quinquaud, Leloir, Jarisch, and Mott.

Hysteria seems in some cases to be the possible cause. Instances of this kind are recorded by Kaposi and Hardy.

At the same time there are many classical cases of pemphigus in which no alteration, material or functional, of the nervous system can be demonstrated. Kaposi, for instance, examined nine consecutive cases of pemphigus which had terminated fatally, and in only one of them were there morbid changes in the spinal cord, and even these did not seem to him characteristic.

Contagiousness in the adult has never been observed, and the transmissibility in children in the form of epidemics rather constitutes a disease quite different from pemphigus, as has been previously pointed out. Still, many authors are inclined to look upon the disease as due to the effect

of pathogenic microbes. Paul Gibier, for instance, found in the pemphigus bullæ and in the urine beaded organisms. Demme succeeded in demonstrating and cultivating diplococci in large numbers from the bullous contents; he also saw very large isolated cocci and some bacilli. The small diplococci were also found twice in the blood and once in the urine. As his researches refer, however, mainly to so-called acute pemphigus, his results admit of a different explanation. Daehnhardt and Spillman have arrived at results similar to those of Demme. Inasmuch, however, as it has not been shown that those different bacteria are present from the beginning, their occurrence may be looked upon only as a coincidence, and their pathognomonic character is therefore quite doubtful.

In a typical case of pemphigus foliaceus, which has been for more than a year and is still under the writer's care, it has been quite impossible to find any appreciable cause of the disease. Previously the patient had always enjoyed the best of health. But the influence of her psychical condition upon the state of the skin was quite apparent. During the last winter she lost, within a short time, both her parents, and was much grieved at this. During that period a sudden alarming exacerbation took place; while previously only few and isolated blebs had appeared, almost the whole integument now became involved. Supervening pregnancy did not seem to interfere with a decided improvement which took place under appropriate treatment, and at the time of her confinement her skin had, with few exceptions, become almost normal; but immediately after her delivery a severe relapse came on.

An interesting case of pemphigus, with a rather unusual course, is reported by Kirschner (*Arch. für Derm. und Syph.*, 1892); he attributes the disease to a cessation of the perspiration, and saw good results from the use of different diaphoretics. In a similar way some cases have been attributed to chills, as is shown by Crocker and Schwimmer.

Diagnosis.—We must emphasize again that the presence of some or many bullous lesions on the skin is not sufficient to constitute the diagnosis of true pemphigus. The successive, eminently chronic appearance of large blebs, without any antecedent lesions, and the frequently fatal issue, are the essential features. The history of the case, the existence of bullæ in different stages of development, pigmented spots, indicating former lesions, will aid in deciding the nature of the case.

The disease can easily be differentiated from erythema bullosum and urticaria bullosa, which show distinct signs of inflammation, and the simultaneous presence of erythematous spots and wheals. Erythema is usually confined to the back of the hands and feet; urticaria causes considerable itching. Varicella bullosa differs from pemphigus by its acute cyclical course. In impetigo contagiosa the pustular character of the lesions, the history of infection, the benign character, will be deciding;

we also refer to our remarks made above, showing that many cases of so-called epidemic pemphigus in children are probably only instances of impetigo contagiosa. In eczema there are rarely any large blebs present. In herpes the eruption is always localized, the lesions are smaller and grouped together, and the disease is of an acute inflammatory character. Erysipelas and scabies have too characteristic features of their own to make a confusion with pemphigus probable. Syphilis produces bullæ usually only in newborn children, and then the palms and soles are chiefly affected. In lepra the recognition of anæsthetic spots, with other characteristic features, will facilitate the diagnosis.

In dermatitis herpetiformis bullæ may often occur, but the coexistence of other multiform lesions, papules, wheals, vesicles, pustules, scratch-marks, the variability in the character of the different outbreaks, and the distinct pruritic element, will be decisive.

Bullous drug eruptions, produced, for instance, by iodide of potassium, different balsams, and some other drugs, will usually promptly disappear with the discontinuance of these medicaments.

It should be remembered that insane persons, hysterical women, and so-called hospital simulators, will sometimes artificially produce bullous lesions ("feigned eruptions") by the application of cantharides and other vesicants.

Generalized cases of pemphigus foliaceus, with ill-developed or no bullæ at all, may offer some diagnostic difficulties; a differentiation from eczema rubrum, pityriasis rubra, the different forms of exfoliative dermatitis, universal lichen ruber, and psoriasis, will then become necessary. The history of previous bullous lesions, and careful observation for a short time in order to detect some new flaccid bleb, will usually enable us to establish the diagnosis.

Pemphigus vegetans has in former times often been confounded with syphilis, and might even to-day offer considerable difficulty in the diagnosis; the negative influence of antisyphilitic remedies, the occasional appearance of bullæ, the predilection of the vegetations for certain localities, the absence of any history of infection, and the grave, progressive character of the disease, will speak for pemphigus vegetans.

The differentiation from impetigo herpetiformis will be considered in the chapter devoted to that disease.

Prognosis.—Nothing emphatic should ever be pronounced in any case of true pemphigus, as the possible duration and the final outcome can rarely be foretold. Many cases of pemphigus vulgaris get well in time, but a number of them may merge into the foliaceus variety, which is always a grave disease and usually has a fatal termination. Pemphigus vegetans has, so far, almost invariably proved fatal. The general condition of the patient, the presence or absence of complications on part

of the nervous system or the intestinal organs, the age of the patient, the duration of the disease, the extent of the cutaneous involvement, and the condition of the mucous membranes, will all have to be considered in formulating the prognosis. Modern advances in dermato-therapeutics have surely made the outlook somewhat brighter, and a goodly number of even severe cases have been cured. The writer's case of pemphigus foliaceus, mentioned above, looked for a time almost hopeless. Her whole body was covered with lesions; she had no rest through constant burning and itching, and was much reduced in strength. There was considerable œdema in the lower limbs. In spite of this she recovered gradually, and at the time of her confinement was almost entirely well. Unfortunately, soon after this a severe relapse came on. But even the possibility of temporarily improving such a terrible disease must be a source of gratification.

Treatment.—As the etiology of the disease is so obscure, it is evident that the lines of treatment directed toward a cure can not be sharply drawn. Time and experience have proved that no reliance can be placed on the different specifics, alteratives, derivatives, cathartics, drastics, diuretics, diaphoretics, or what not. Two drugs may be used, however, with a fair outlook for beneficial action: they are arsenic and quinine. The first of these has been highly recommended by Hutchinson, Bulkley, and others, and, while by no means sure in its effect, is undoubtedly of much value. It should be given either in the form of Fowler's solution or the so-called Asiatic pills. It is best to begin with small doses, slowly increasing up to a point where a distinct impression is made, or when the limit of the patient's tolerance is reached. Bulkley praises especially the use of the drug in small doses frequently repeated. In the case of a young boy who for over a year had suffered from repeated and prolonged attacks of pemphigus vulgaris, I prescribed Fowler's solution in connection with tincture of nux vomica, iron, and quinine, and succeeded by this and by simultaneous warm baths and a mild ointment in arresting the disease, and at least temporarily healing the skin within one week. A relapse which followed in a few months promptly yielded to a similar treatment, since when the little patient has remained well for several years.

Quinine should be administered in large doses. The writer's patient suffering from pemphigus foliaceus, mentioned above, took for many weeks a three-grain quinine pill every hour during daytime without showing any toxic effects. To this drug, above all, I attribute the great improvement in this case. Tonics in general, particularly the different preparations of iron, strychnia, cod-liver oil, and malt, should be given, with a view of improving the usually lowered strength and vitality of the patient. At the same time special attention must be devoted to the diet, which should be of the highest nourishing order. I have been

unable to convince myself that any certain article, usually considered as irritating to the skin, made any appreciable difference. Patients who for a time would be subjected to a very careful and select diet, seemed to do as well, and better, when allowed anything they would care for. General hygienic measures, good ventilation of the room, pleasant surroundings, avoidance of excitement, or anything that might worry the patient, are points not to be neglected. A few cases are reported in which atropia had a good effect. They were probably such in which an urticarial element was predominating. In pure cases of pemphigus I failed to see any beneficial action. I have also tried preparations of ergot, without, however, observing any special advantage from its use.

The local treatment must have for its prime object to keep the patient comfortable, and it is usually only after many trials that the most agreeable application can be selected. In one case, mild dusting powders, such as oxide of zinc, starch, or bismuth, may act pleasantly. In others, lotions will be preferable, such as glycerin and rose water, with or without zinc, borax, thymol (1 to 2,000), lead water, diluted limewater, or calamine liniment. For specially painful raw places a cocaine solution may be used. Sherwell recommends very highly the local use of linseed oil, and combines with this the internal use of a decoction of linseed meal in ounce doses with milk.

Ointments will often afford relief, but care should be taken not to have them too stiff or drying, since such may cause a feeling of tension on the skin, and can be removed only with difficulty. Vaseline, rose ointment, or lanoline with a considerable addition of rose water to make it soft and cooling (after the pattern of Unna's cooling salves), are useful for a base, and to these may be added five to ten per cent of oxide of zinc, or subnitrate of bismuth, of three to five per cent of sulphur, the same quantity of ichthyol, boric acid, and other mild and non-irritating substances. Whatever might be useful in a case of eczema rubrum can be used for pemphigus as well.

It is usually best to open the densely filled bullæ by pricking them with a needle and gently removing the contents. In this manner a sort of protective covering is afforded for the raw rete, and the accidental destruction of the bleb wall and the exposure of denuded places are avoided.

The question of the applicability of baths is one to be decided entirely by the comfort it gives to the patient in individual cases. Of course, as far as practicable, it is always best to keep the surface as clean as possible from dried-up secretions and detritus; but there are patients who very much resent the use of a warm bath for this purpose, who complain of severe burning from it, and who are quite exhausted after it. For all severe cases, particularly those belonging to the type of pemphigus foliaceus and vegetans, the continuous water bath offers a most excellent and

convenient form of treatment. By this we do not mean an ordinary tub bath used for several hours in succession, but we refer to the older Hebra's ingenious device, called by him the permanent water-bed, as used in the Vienna General Hospital for severe cases of combustion, pemphigus, and other skin diseases, in which a large surface of the body is laid bare. Arrangements to keep the patient constantly immersed in warm water, in which he eats, drinks, and sleeps, are carried out to a degree of perfection; the water is flowing through the bath all the time; it is kept at a uniform temperature, or, according to the wish of the patient, can be made warmer or cooler. Resting on hair pillows, and on a frame inside of the bath, which acts as a bed, he can easily be raised or lowered. One must have seen the water-bed in operation, and observed the apparent comfort with which patients remain in it, to appreciate its value. In Vienna patients are often kept in the continuous bath for months at a time, to their greatest advantage. In private practice it will, of course, be difficult to imitate this. Different drugs may be used to medicate the bath. Bran makes it very soothing; permanganate of potash dissolved in it has been highly recommended by Weber and Bodenschatz. Unna recommends sulphate of iron and tannic acid for the same purpose; likewise alum, sulphur, and sublimate, in proper proportion, may be used occasionally.

IMPETIGO HERPETIFORMIS. (JOSEPH ZEISLER.)

Definition.—An inflammatory disease of the skin, characterized by the appearance of groups of miliary pustules in certain places of predilection, often associated with pregnancy, and usually running a fatal course.

This peculiar and very rare disease was for the first time clearly described and denominated by Hebra in 1872 (*Wiener med. Wochenschr.*, 1872, No. 48), based upon the observation of five cases that had occurred in the General Hospital of Vienna. Two previous observations by Auspitz, recorded under the name of herpes vegetans (*Arch. für Derm. und Syph.*, 1869), are probably of the same nature, though modern critics incline to class it with pemphigus vegetans. Duhring, who in his former publications considered it as the pustular variety of his dermatitis herpetiformis, has more recently abandoned this view, and recognizes, with Brocq, Kaposi, and others, its independent position. The whole number of undoubted cases published so far is, perhaps, less than twenty. Most of these must be credited to Kaposi, who, in 1887 (*Viertelj. für Derm. und Syph.*), gave a classical account of the disease. Maret (*Thèse de Strasbourg*, 1887), Th. du Mesnil and Marx (*Arch. für Derm. und Syph.*, 1889), Dubreuilh (*Ann. de Derm. et Syph.*, 1892), have each reported one case. The last-named author, in his exhaustive monograph, makes a

critical review of the whole question, and, on account of more or less deviation from the type to be described, throws out quite a number of cases claimed as impetigo herpetiformis, among others those of Heitzmann (*Arch. de Derm.*, January, 1878), Sherwell (*Journ. of Cut. and Gen.-Urin. Dis.*, 1889, p. 456), Zeisler (*Trans. Ninth Intern. Cong. and Monatsh. für prakt. Derm.*, 1887, p. 950).*

Symptomatology.—The cutaneous lesions consist in small pustules, which from the start contain a whitish or yellowish puriform fluid; they are superficially seated, rarely of more than pinhead size, and stand closely grouped, forming roundish patches of the size of a lentil to that of about a half-dollar piece, surrounded by an erythematous, slightly tumefied zone. In the measure as the patches enlarge, their central portion desiccates to a brownish crust, which then appears encircled by a smaller or larger band of miliary pustules. The peripheral extension of the process is always marked, and preceded by the progressive march of the erythema. The removal of the central crust discloses the denuded rete layer, usually covered by grayish-white masses. In some places there forms underneath the crust a thin, dry epidermis, which for a time may desquamate; in others the skin remains excoriated, inflamed, oozing, and very painful. In localities where two cutaneous surfaces oppose each other, where naturally deeper folds exist—as in the genito-crural, perineal, and anal folds, underneath the female breast, in the axillæ, in the transverse abdominal fold, around the neck, sometimes in the popliteal and cubital spaces—the excoriated and inflamed skin may become covered with a thick, pulpy mass, of grayish color, causing a most disagreeable odor. These places may become the seat of flat vegetations, very suggestive in their outward appearance of syphilitic condylomata, and resembling (if not identical with) those observed in the rare cases of pemphigus vegetans. The original small patches may, by their centrifugal progress and by coalescence, increase so as to cover quite large surfaces; but their borderlines show the same characteristics, miliary pustules, and surrounding erythema. Their outlines are roundish, formed by segments of circles.

While at first certain places of predilection can be distinctly noted, particularly the inner side of the thighs and groins, below the breasts, around the navel, the axillæ, the wrists, and those mentioned above, the extension of the process may eventually lead to an involvement of almost the whole integument. The scalp may form one large excoriated, oozing surface, with the hair matted together, and causing an almost unbearable, fetid odor; the nails, too, are frequently affected, groups of pustules form-

* While Dubreuilh considers my case of impetigo herpetiformis—which for a long period at least corresponded in all respects to Kaposi's description—as an instance of pemphigus vegetans, because during the last stages bullæ formed, Th. du Mesnil calls it a typical case.

ing around and underneath them and causing considerable swelling of the phalanx, not unlike a felon; the palms and soles become involved; in fact, no place remains exempt. The mucous membranes are usually attacked in a similar way; indeed, they show often the only evidences of the disease long before the skin in general is implicated. The lips may be raw; they become easily covered with shell-formed, brownish or blackish crusts; they bleed easily and cause excruciating pains. In the mouth, which is opened only with the greatest difficulty, irregular, grayish plaques, not unlike mucous patches, can be seen on the tongue, the cheeks, and in the throat. This makes mastication exceedingly painful, and causes a very fetid exhalation. The nostrils are likewise affected, and clogged with crusts; the conjunctivæ, the vulva, and vagina may also be involved. In one remarkable case of Kaposi's the post-mortem examination even revealed lesions in the œsophagus.

In some few cases, which otherwise corresponded fully to the type described, there were noted, after the disease had lasted for several months, the formation of larger bullæ filled with a sero-purulent fluid and exhibiting, after the removal of the bleb walls, the grayish, pulplike masses mentioned above, extending in all directions, even beneath the apparently healthy surrounding skin. (A similar condition can sometimes be observed in severer degrees of combustion.)

Even in grave cases ulceration has never been observed; accordingly, when the skin finally heals up no cicatrization takes place.

The eruption does not extend continuously, but shows distinct successive impulses, marked by the appearance of new foci of eruption or by the progression of old patches. These attacks are always preceded and accompanied by rigors, and a high fever, which soon subsides again. The general condition of the patient suffers accordingly at these exacerbations; the tongue is dry and coated, the bowels are loose, the discharges are sometimes bloody, there is absolute anorexia, considerable thirst, and general prostration; the urine contains high amounts of urea, and albumin is found in it, at least during the later stages of the disease. Then, also, nervous phenomena may be a prominent feature; delirium, convulsions, muscular contractions, stiffness of the neck, nystagmus, and localized paresis have been noted. The subjective symptoms of the patient are variable. When lesions on the mucous membrane are present, the chief complaint is usually the burning pain of the lips and in the mouth. Itching may be quite marked in some cases, but is absent in others.

The duration of the disease has been found to vary from a few weeks to about five months. The majority of the cases so far observed have ended fatally. In very few of them recovery took place after a few months, but some of them had several relapses.

Etiology.—All the first cases recorded were in women, and mostly

(eleven) in such as were pregnant; an association with this condition, therefore, seems only too natural. What, however, the relation of the impregnated uterus to the skin disease is, has not been found out. A pyæmic condition has been suggested by Neumann, who looks upon the eruption as a sort of metastasis; but only in one case were endometritis and peritonitis found post mortem. Kaposi was the first to describe a case in a man in whom tubercular peritonitis and chronic pachymeningitis were found post mortem, and since then Dubreuilh has observed another. This must lead us to finally discard the idea that pregnancy, or some diseased condition in the womb, is the only pathological factor.

Of late years special attention has been paid to the possible influence of specific microbes; but, while the streptococcus albus and aureus have been demonstrated in the lesions, there is nothing pathognomonic in these results, as those microbes can be noted in all possible suppurative processes. After all that we know as yet about impetigo herpetiformis, we must declare that we are perfectly in the dark about its real cause.

Pathology and Morbid Anatomy.—Nothing of a constant nature has been found in the few cases on record to throw much light upon the pathology of the disease and to explain why it should be so fatal. The microscopical examinations of Du Mesnil and Marx and those of Dubreuilh show a dilatation of the blood and lymph vessels. Their endothelium is swollen, and they are diffusely surrounded by embryonal cells. The inter-papillary prolongations appeared enlarged in all their dimensions. In the papillary body there is considerable round-cell infiltration. The glands of the skin show no material changes. The pustules themselves are very superficially seated in the epidermis.

Diagnosis.—The chief points upon which to base the diagnosis of this rare disorder must always be the successive appearance of groups of small miliary pustules, which spread out peripherally, while the central zone crusts over; the invasion of the special sites of predilection, enumerated above; the affection of mucous membranes, particularly those of the lips; absence of ulceration; frequent association with pregnancy; grave implication of the whole economy; and almost inevitable fatal result.

Dermatitis herpetiformis in general, and its variety, herpes gestationis, differs from impetigo herpetiformis by the polymorphous character of the lesions, pustules only appearing accidentally or temporarily, by the marked pruritus, the generally milder character of the disease, the usually favorable termination.

With pemphigus, particularly the vegetating variety, confusion is not only possible, but the resemblance of the two diseases in many points is so strong that their differentiation may be a most difficult task, even for the expert dermatologist. Only an observation of the case for a long period, and full knowledge of the manner in which the skin lesions made

their *début*, will enable one to make a decision; for, as we pointed out elsewhere, the vegetations are not a feature pathognomonic or typical of pemphigus vegetans only. Where bullous lesions are those chiefly observed, the diagnosis will naturally be in favor of pemphigus. Where grouped pustules have been the characteristic feature from the start, and during a long period of the disease, the occasional appearance of a larger bleb will not alter the diagnosis of impetigo herpetiformis; but, after all, we could not consider a confounding of the two diseases as a fatal error, for we know about the nature and treatment of both just about the same. We should, however, regard a mistaking of the disease for syphilis as a serious error. The absence of real ulcerations, the symmetrical distribution of the lesions and the negative effect of specific remedies, the usually fatal course, and the absence of any history of infection, should exclude syphilis.

Prognosis.—This is always very grave, only few cases of complete recovery having been recorded so far; those that have withstood one or more attacks during successive pregnancies have mostly succumbed at last to a relapse of the disease. Confinement, which often takes place before the completion of the full term, does not seem to change the dangerous aspect of the trouble. The offspring, though only in one case affected by an apparently similar skin eruption, rarely survives very long, even if born at full term.

Treatment.—The limited experience in regard to this disease does not enable us to map out anything like a determined plan of management. Internally, tonics (particularly quinine in full doses) might be tried. Locally, mild antiphlogistic applications, weak sulphurous ointments, and diluted tincture of iodine could be used. In severe and generalized cases the continuous water-bath, mentioned above (*vide* pemphigus), will better succeed in making the patient comfortable than anything else.

PRURIGO. (JOSEPH ZEISLER.)

Derived from *prurio*, to itch.

Definition.—An eminently chronic disease of the skin, usually beginning in early life, characterized by the appearance of small papules, principally on the extensor surfaces, excessive itching, and secondary changes resulting from scratching.

General Remarks.—It must be emphasized, at the outset, that the term *prurigo* is by no means identical or to be confounded with that of pruritus. While pruritus, or itching, is a prominent symptom of prurigo, this name has been given by Hebra to a distinct clinical entity, and the authoritative statement of Besnier notwithstanding, we fail to recognize

anything like a *prurigo senilis*, *prurigo pedicularis*, *vulvæ*, *scroti*, and the like, though these terms may be well understood in France. But apart from this mere misapplication of the above term, numerous attempts have been and are being made up to to-day, by different authors, to depose prurigo from the firm position which it has for a long time held in the system of skin diseases—to, as it were, wipe it out of existence, and to look upon it either as a form of papular eczema, of urticaria, of pruritus, or to class it with the lichen group, as Vidal and Brocq would have it. We admit that the pathology of prurigo may be in need of more elucidation, but we maintain that its clinical picture is so remarkably sharp and clear as to insure for it in the mind of unbiased dermatologists, for all time to come, an independent position; and we strongly protest, until new pathological or etiological facts are developed, against the overthrowing of the nosological type created by Hebra.

Frequency.—The disease is by no means very common, not even in Austria, which is regarded almost as its home, and until recently it was held that in England and in the United States it was nearly unknown, or at least excessively rare. In a paper read before the American Dermatological Association (Jour. of Cut. and Gen.-Urin. Dis., November, 1889), I have shown that true cases of prurigo surely exist in America, though probably less often than in continental Europe, and to a great extent as the result of importation from abroad. I found it to form not quite one per cent of all cases of skin diseases under my own observation, though previous statistics of the before-named body give it only 0·027 per cent. This small showing was probably due to the desire on the part of American observers to restrict the diagnosis of prurigo to absolutely classical cases of the disease, or to that form of it known as **prurigo ferox**.

Symptomatology.—The disease makes its inception at an early age, usually between the eighth and twelfth month, and for some time does not present any of its later characteristic features, but appears as a sort of urticaria with all those subjective and objective features which distinguish this common trouble of infant life. During the second year, or sometimes later, there can be noticed, at first isolated, then numerous disseminated, minute papules, forming slight, firm elevations of the size of a hemp seed to that of a lentil. As their color at first does not differ very much from that of the surrounding skin, they can be felt rather than seen, but on account of the intense itching which they cause they are soon irritated through the scratching finger nails, become more raised, reddish, and covered on their tops by brownish crusts—the result of dried-up serum or blood. They occur principally upon the extensor surfaces of the extremities, but also scattered on the trunk, and occasionally on the face. The further evolution of the process is determined chiefly through the effects of scratching, which finally leads to secondary changes

in the skin—a condition which has been termed by Brocq *lichenification*. Linear, superficial excoriations, and even deep destruction of the skin, bloody crusts, pustules, and ecthymatous lesions are thus produced, the lanugo hairs are broken off, there are deep pigmentation and consider-



FIG. 21.—Prurigo.

able thickening of the skin, extending over large areas or confined to smaller patches, and all degrees of artificial dermatitis (eczema). In examining a well-developed case of prurigo of several years' standing one must be immediately struck by the peculiar picture presented. The patient has a pale appearance, the skin is generally dry and harsh, slightly scaly, retaining only in a few localities a smooth and apparently normal appearance. This may be around the neck, in the axillae, in the cubital folds, the palms, the inguinal region, anal folds, popliteal spaces, soles, and occasionally also the back of the feet. The intensity of the disease seems to increase from upward down, so that the upper extremities are affected to a lesser degree than the lower ones, and the forearms and lower limbs more

so than the upper arms and thighs respectively, while the extensor surfaces, as was mentioned before, are much more invaded than the flexor ones. Wherever the lesions are most copious, where scratching has worked most mischief, there the pigmentation will be particularly

pronounced and of a dark brownish tint. An attempt to raise a fold of the skin in such places will reveal the enormous thickening in all the layers of the cutis. On the trunk and the back, though these regions may be pretty largely covered with different lesions, the disease shows a much milder character. A very striking and almost pathognomonic feature are the massive glandular swellings in the groins, which stand out very prominently, and smaller ones, though less regularly, in the axillæ and epitrochlear regions. The mucous membranes are entirely exempt. On the scalp there are occasionally some scratch-marks, but in cases of long standing the hair becomes dry, brittle, and dusty. The discovery of typical prurigo papules on a well-developed case is not always easy, as they are rarely allowed to exist for any length of time without being torn open; but a repeated and careful search will usually reveal some of them without much difficulty.

The story of the subjective symptoms of a patient who for years has been the victim of prurigo is usually an appalling one, for the itching which this disease causes is so intense that the poor sufferer has little enjoyment of his life, and is apt to become almost melancholic. Especially at night, under the influence of the warm bed, the pruritus becomes nearly intolerable, so that the patient will scratch and tear his skin, until, quite exhausted, he at last falls into a restless sleep. That under such circumstances his early education will be neglected, that a selection of a suitable life vocation will meet with serious difficulties, that even suicide will sometimes be attempted, can easily be understood. Fortunately, such cases are not frequent, and in the majority the disease presents a much milder character. Indeed, the Vienna school makes a distinct differentiation between *prurigo agria* or *ferox*, by which the severest forms are designated, and *prurigo mitis*, a much less troublesome variety, which is easily managed and often cured. It seems doubtful whether such a classification in two types is of much practical value, for, like many other diseases of the skin, prurigo shows all degrees of intensity, determined by the number and extent of the lesions, the severity of the pruritus, the intensity of the secondary changes, the frequency of the relapses, and amenability to treatment. It is usually stated that prurigo has a tendency to spontaneous improvement in summer, induced through freer perspiration and consequent moistening or softening of the skin. This is surely true for many cases, but not for all, and Edv. Ehlers, who made a careful study of this question (*Ann. de Derm. et Syph.*, 1892, page 861), in two hundred and seven instances found the reverse to be the rule, judging by the time at which most of them sought admission to the hospitals.

The dictum of Hebra, that the disease once established lasts forever and is incurable, has received much modification at the hands of careful

observers everywhere. There is absolutely no doubt that with advancing years the trouble is likely to abate very much either by appropriate treatment or even spontaneously. This is to some extent borne out by the fact that in childhood prurigo is not very uncommon, but in the adult is excessively rare. The general health of prurigo patients shows often the effect of long-continued loss of sleep and nervous exhaustion. The patient is usually pale and ill-nourished.

Pathology and Morbid Anatomy.—The classical picture displayed by Hebra's masterly pen does not seem to have sufficed to establish the pathology of prurigo upon an incontestable basis. The debate whether the prurigo papule is the primary and essential element of the disease, or whether it is the result of scratching induced by a primary hyperirritability, has been carried on for many years, and does not seem to end. Auspitz particularly, in his *System of Skin Diseases* (1880), contended that the location of the trouble, chiefly on the extensor surfaces, its entire absence on the palmar and plantar surfaces, pointed to an implication of the lanugo hairs. To his mind the disease was essentially an idioneurosis, affecting the sensory as well as the motory nerves—the former inducing the itching, the latter producing a contraction—a chronic spasm of the fine erector muscles around the hair bulbs, which results in the formation of the epidermal elevation, a sort of lichen pilaris. Suggestive as this theory may seem, it is not borne out by the recent anatomical researches of Leloir and Kromayer. The fact remains that many prurigo papules show, neither macroscopically nor histologically, any relation to lanugo hairs and that the common lichen pilaris gives rise to hardly any itching whatever; and Caspary (*Viertelj. für Derm. und Syph.*, 1884, p. 344), who tested the question experimentally, was unable to remove the claimed "spasm" of the erector muscles by either the galvanic current or the subcutaneous injection of atropia. The opinion of Riehl (*ibid.*, p. 41), that prurigo is merely a form of chronic urticaria, is based chiefly upon the well-known fact that the eruption of wheals very often is a sort of preliminary stage of the disease, but corresponds otherwise neither to histological nor well-observed clinical facts. Kaposi finds little difference between the anatomical nature of the prurigo papule and that in eczema, but still maintains the independence of the disease on its general nosological features. Brocq (*Gaz. des Hôpitaux*, 1892, No. 22) ranges prurigo among his "secondary lichenifications," considers the pruritus as the primary factor, but recognizes the typical nature of the papule. Vidal, as mentioned in our introductory remarks, denies that prurigo is an independent disease (*Sec. Intern. Derm. Cong. at Vienna*, 1892); under the name of *lichen polymorphus ferox* he classes it along with purely papular eczema and some other affections in one large group—the lichens. He considers the prurigo papule as produced by scratch-

ing, and the whole process as a neurodermatitis. Ehlers is much of the same opinion.

That the prurigo papule has peculiar features of its own seems now to be settled, since the careful histological researches of Leloir and Tavernier (Ann. de Derm. et Syph., July, 1889), which have since been pretty fully confirmed by E. Kromayer (Arch. für Derm. und Syph., 1890, p. 77), Du Mesnil (Monatsh. für prakt. Derm., xv, 262), R. W. Taylor and Van Giesen (New York Med. Journ., January, 1891), and Darier (Ann. de Derm., 1893, p. 895). According to these investigators, the prurigo papule is characterized during its earlier development by a round or somewhat irregular, always single, cavity within the Malpighian layer, which seems to originate by the destruction of a large number of cells in that portion of the derma. Unlike the cavity seen in vesicles or pustules, it occupies the central part of the Malpighian body, enlarges toward the epidermis, which forms its upper wall, but does not extend into it. Seen under the microscope, the cavity is always found empty, but during life contains necrotic epithelia and some nuclei. It seems to connect with a duct of a coil gland, and is probably an enlarged sweat duct (which would explain the diminished perspiration peculiar to the disease). Gradually the little cavity enlarges, and may thus reach the horny layer, without, however, destroying it. Through a hornification of the side walls there results at last a sort of cyst, filled *in vivo* with clear serous fluid, containing modified epithelial cells and a few white blood-corpuscles. Besides this there are signs of hyperæmia, indicated by enlargement of the blood and lymph vessels. The nerves were found intact, contrary to former French observations. The other anatomical features found in the thickened plaques are those usually met with in all forms of chronic hyperplasia of the skin.

By these investigations the proof has been furnished that the primary lesion of prurigo is very different from that in papular eczema and other papular diseases. That it is really a *primary* lesion, and not the result of scratching, is a fact which Hebra pointed out long ago, and which many careful observers have since confirmed, negative assertions notwithstanding.

To look upon prurigo as a pure neurosis, as a sort of pruritus with a peculiar localization, is absolutely unjustified, as in this latter affection even the most violent itching and scratching do not lead to the development of any special lesion, nor to the typical pigmentation and thickening of the skin.

It remains for future examinations to show whether there is, perhaps, a peculiar toxine in the blood forming the true cause of the disease; what influence, if any, possible micro-organisms may have (though this does not seem probable); or whether a trophoneurotic disturbance is the

essential factor. For the present we must confess our inability to satisfactorily explain the true pathology of the disease.

Etiology.—It is generally conceded that prurigo occurs chiefly in people of the lower classes, who devote little or no attention to the hygiene of their skins. But whether this is sufficient to explain the relative preponderance of the disease in Austria and some other European countries, and its comparative rarity in America (where admittedly even poor people enjoy by far better opportunities concerning their personal cleanliness), or whether geographical and climatic causes are the determining factors, are questions which, of course, can not be easily answered. The disease has, however, been occasionally found among people in the better walks of life. It attacks, as a rule, children whose general health and nutrition are below par. It has often been observed in those who exhibit distinct signs of scrofulosis. Only exceptionally it is observed in otherwise perfectly healthy subjects. Concerning the sex, it seems to favor the male, and Ehlers (*loc. cit.*) finds it twice as often in them as in the female. That it begins at an early age in almost all cases has already been stated. French observers claim that it occasionally makes its beginning during the second childhood, and Ehlers has observed it in nine cases where the age varied from fifteen to thirty years. Besnier calls attention to the fact that the disease often favors the Jewish race. Heredity seems to exert, if any, but little influence. The fact that occasionally several members of the same family are affected by it, points rather to the influence which the same surroundings and habits exert. Neither does contagion ever produce it. The influence of the seasons has been mentioned above.

Diagnosis.—Whoever has once seen a typical case of prurigo will hardly fail to recognize the disease when meeting it again, for its clinical picture, as we have pointed out, is exceedingly characteristic. While an expert may often, from the pale, dry appearance of the face, and the dusty aspect of the scalp, surmise the presence of the trouble on the body, it is only an examination of the whole integument at once that will bring out the classical features. The smooth places in the inguinal, cubital, axillary, and popliteal places, the presence of buboes in the groins, the darkly pigmented, thickened, rough condition of the skin on the extensor surfaces of the extremities, the distinct preponderance of the symptoms on the most dependent parts, the history of the disease, beginning in early childhood, and the subjective complaints of the patient as to the intensity of the itching, will enable one to make a correct diagnosis, even if the detection of the typical prurigo papules should be difficult. During the earliest stages of the disease a confusion with urticaria would be liable, but in time the main trouble will become apparent. Again, when the disease is considerably aggravated by eczematous lesions, doubt may

arise. From the different forms of pruritus it can be easily distinguished, as, in this disease, even when the itching is most excessive and of long duration, there never results that thickened condition of the skin so peculiar to prurigo. Scabies and pediculosis can be excluded without difficulty. Ichthyosis occurs on about the same localities, but does not cause much itching, and never produces infiltration of the skin.

Prognosis.—It has been stated already in the foregoing, that we can no longer subscribe to the opinion of Hebra, that prurigo once established is an incurable disease and lasts to the end of life. That the milder cases—those usually termed *prurigo mitis*—are easily managed and mostly cured is a fact which nobody can doubt. But even the severer forms show a certain spontaneous disposition to improve somewhat toward puberty; and in the measure as the patient gets older, as his circumstances improve, as he becomes free of his former misery, poverty, poor nourishment, impure air, unhealthy abode, and the influence of parasites, he will develop signs of improvement. A case which lasts beyond puberty gives little hope for a permanent cure, and can at best, by constant care and systemic treatment, be improved temporarily. Where the type of prurigo ferox is present at an early age, the chances for recovery are exceedingly slim.

Treatment.—An important factor in the management of prurigo is to improve, as far as possible, the general sanitary and hygienic conditions surrounding the patient, to secure a nourishing diet, to provide for plenty of fresh air, a clean bed, and, in fact, whatever constitutes a rational mode of living.

Internally, tonics may be given with a view of improving the general health. Cod-liver oil, plain or with iron, extract of malt, iodine, phosphorus, and the like, will admirably serve this purpose. Arsenic exerts, if any, but very little influence, even if given perseveringly and in full doses. Carbolic acid, in pills of 0·1 (gr. jss.), ten to fifteen of which are to be taken daily, was recommended in 1869 by Kaposi, but does not by other observers seem to have fulfilled the expectations placed upon it. It surely is not a very pleasant drug to take inwardly, and not quite free from danger. Pilocarpine, in subcutaneous injections (0·01 *pro die*), has been suggested by O. Simon and Pick. This drug not only produces free perspiration—a feature so desirable in prurigo—but seems also to cause to some degree a softening of the infiltrated skin. Great care should, however, be taken in employing it, as it often produces alarming signs of general depression. Schwimmer has seen good effects from ergotine in doses of 0·05 to 1·00 gramme *pro die*. More recently antipyrine, in small doses (0·1 to 0·2), has been proposed by Blaschko, not only for all sorts of urticarial rashes, but also for prurigo. It is strange that a drug, which itself often produces a sort of urticaria, should benefit the

same trouble; but it surely relieves the itching sensation in prurigo. Crocker praises particularly the internal use of the tincture of cannabis Indica. He gives it in full doses, beginning with about five drops, three times daily, for a child of eight to ten, and increases it to thirty minims immediately after meals, and allowing an interval of a fortnight every six weeks. He observed from its use dullness of intellect and loss of memory, but these soon passed off.

Our chief resources in treating prurigo are, however, local remedies. Foremost among these must be mentioned water, in one form or another. Daily warm baths of an hour, either plain or medicated by one to two pounds of carbonate or bicarbonate of soda, exercise a very soothing influence upon the highly irritable skin; and herein lies a great difference from eczema, where baths, as a rule, prove irritating and aggravating. Sulphur has always been justly considered as very valuable in mitigating the disease. It may be given as an addition to the bath, in the form of sulphide of potassium; as a soap; in the shape of Vlemingx's solution of lime and sulphur; or of an ointment, ten to twenty per cent strong. As it constitutes a powerful ingredient of many of the hot springs in this country and in Europe, a sojourn at such watering places is usually quite beneficial. Unfortunately, the disease is so chronic that the good influence which they temporarily exert is soon lost. The different preparations of tar, also, are quite useful. An effective way to employ them is the so-called tar bath. The patient, being painted on the diseased surfaces, partially or totally, with one of the different tar oils—best the birch tar oil (*oleum rusci*)—is immediately placed in a full warm bath, in which he remains for one or a few hours, according to his comfort, after which he is soaped off and anointed with a mild salve. A valuable combination of sulphur with tar is given in the well-known Wilkinson ointment (*ung. simpl., sapo viridis*, āā 100 parts; sulphur, *oleum rusci*, āā 50 parts, *creta alba*, 10 parts). A very convenient, clean, cheap, and effective treatment was recommended some ten years ago by Kaposi. It consists in the daily application of a salve containing five parts of β -naphthol in 100 of plain fat. For children the amount should be reduced to about two to three parts. Under the regular use of this preparation the improvement is soon apparent, even when baths are dispensed with. Jacquet and Tenneson have recently advised, as a chief part of successful treatment, the enveloping of the affected extremities in thick layers of absorbent cotton, caoutchouc, and the like. Galvanized rubber sheets and garments have long been in use, mainly for the macerating influence which they exert, and for the effect of the sulphur which thus comes into action. But this new recommendation is based upon the well-known experience that exposure to the air and again to the influence of the warm bed excite violent attacks of itching, and that in the effect of scratching lies the chief source

of the aggravation of the disease. All this is prevented by covering the irritable skin with an even, protective dressing, which may of course be combined with the use of some suitable salve.

A great deal of tact and good judgment is required in treating an inveterate case of prurigo, and the physician should be careful not to exhaust his medicinal treasury too soon. It is necessary to combine and vary the different medicines mentioned in the foregoing, so as to retain the attention and confidence of the patient and to avoid his getting used to that or another drug.

Where there is considerable acute dermatitis (eczema) it may be best to attend for a while principally to this complication. Thickened patches can be softened by bandaging them with Hebra's diachylon ointment, to which five to ten per cent of salicylic acid is added.

An important point is to keep the treatment up long enough. To stop it as soon as the skin has assumed a fairly smooth appearance would be a grave mistake. On the contrary, the patient must for months, and even for his lifetime, continue to pay the strictest attention to the care of his skin. The frequent use of protracted warm baths must become a second nature to him. He must regularly anoint his skin, according to his condition, with emollient or more astringent salves, as otherwise relapses would be sure to occur soon.

ECZEMA. (H. G. PIFFARD.)

Derivation, ἑκζεῖν, to boil over.

Synonyms: Fr., Eczème; Ger., Eczem.

There can be little question that eczema may very properly be considered the most important affection of the skin with which either the general practitioner or the specialist has to deal. It occupies certainly more than one half of the entire realm of dermatology, due to its frequency and its importance as regards its therapeutical aspects. While many cutaneous affections will present almost unvarying characteristics and typical manifestations, eczema is noted rather for its polymorphism, as exemplified in the many varieties of aspect which it presents. Under these circumstances an accurate and at the same time concise description of eczema is almost impossible. A dozen consecutive cases may present themselves to the physician in a day or a week, and yet no two of them will look alike, or appear on superficial examination to be examples of the same morbid condition. They can hardly even be said to bear what may be termed a family resemblance. Despite this fact, however, certainly in nineteen cases out of twenty the experienced physician will not mistake an eczema when he sees it. These differences of aspect are com-

monly due to the occurrence of lesions which may be quite dissimilar in character and appearance, and exhibiting themselves separately or combined in ways and proportions almost without number, and these differences varied again in a measure by the constitutional peculiarities of the different patients. The aspect, too, of the individual lesions may vary to a very considerable extent, according to the location they occupy, the greater or less degree of inflammatory activity they present, and the length of time they have lasted.

Fortunately for the study of dermatology, the larger proportion of cutaneous diseases are characterized by a single, definite lesion, and it is to be regretted that this rule does not also follow in eczema. In this affection, on the other hand, we may have a variety of primitive lesions, each in a measure characteristic of the affection, each possibly existing by itself as the sole lesion, but nevertheless frequently uniting with each other, so that lesions of different character may coexist in the same patch, or may be variously disposed over different parts of the surface.

The varieties of eczema dependent upon the primitive or characteristic lesion have been variously classified, but to all intents and purposes we may consider them reducible to the six main forms, namely, *erythematous*, *vesicular*, *pustular*, *papular*, *exfoliative*, and *fissured*. Each of these has a more or less definite course, undergoing certain regular changes, and becoming complicated with or giving place to a variety of secondary lesions.

The varieties of eczema which depend on the activity or character of the inflammatory process may be conveniently classed as *acute* and *sub-acute*—terms which are slightly confusing, in view of the fact that the word *acute* is also sometimes used as the designation of an eczema that runs but a short course, while the process, though short, may be subacute in character. When an eczema lasts for a lengthened period of time it is commonly said to be *chronic*, but this by no means implies that it is necessarily subacute, because, strictly speaking, an eczema may persist for many weeks or longer, and the greater part of its course be characterized by an acute process; or, on the other hand, there may be alternations of acute with subacute, the degree of inflammatory action varying from week to week. The terms, therefore, that are in use do not properly and definitely describe the existing conditions. At the same time, it would be difficult to find others that would answer the purpose any better.

Location greatly influences the appearances presented by eczematous lesions, and the principal modifications met with in this connection are those seen on the scalp, face, hands, feet, genitals, and about the anus. Eczema may also invade the follicular apparatus of the skin, and give rise to characteristic affections of the hair-follicles, and probably also of the sebaceous glands. Age also is a modifying factor, and the eczema of

infancy or childhood bears but little resemblance to the typical forms of the disease met with in after life.

Symptomatology.—We will best understand the appearances presented by this protean malady if we trace the course of a simple acute eczema of the general surface.

Eczema Vesiculosum.—Before any visible changes have been recognized, certain subjective phenomena may be apparent. There will be a sensation of heat, possibly, or a slight pruritus. This, however, is quickly followed by a localized congestion of the surface, or a circumscribed erythema, as it might be termed. In a few hours, perhaps, if the part be brought under careful observation, we would be able to discover a crop of minute, closely aggregated vesicles, filled with a clear, transparent serum. These vesicles differ very markedly from those lesions of a similar name that are met with in a number of other affections. We may have vesicles in herpes, in scabies, in varicella, in zoster, etc., but their general appearance differs in a most marked manner from that which characterizes the vesicles of eczema. These lesions are often so closely packed and so small that it takes a sharp eye, and even a lens, to distinguish their separate contours. When closely examined, we find them to consist of a very thin and delicate epidermic covering, which for a brief period retains the lymphic exudation that is seeking an exit. Rubbing, scraping, or other violence from without, or the pressure of the exudation from within, soon ruptures the epidermis, so that usually in from twenty-four to thirty-six hours the vesicles have disappeared, and we find in their place a red, exposed surface, more or less moist with exudation (**eczema rubrum**).

As a matter of fact, the physician rarely encounters an eczema in the vesicular stage. The older writers regarded the vesicles as *the characteristic lesion of eczema*, despite the fact that they occur in only a limited number of cases, and often then escape the observation of the physician.

The vesicles having disappeared, we find in their place, as already stated, a moist and exuding surface. This exudation is peculiar. It is clear and transparent, like water, and yet it is something more than serum, inasmuch as it contains a coagulating material which gives it a somewhat plastic character. If the exudation comes in contact with the undergarments, it stiffens them on drying, as if it contained a minute quantity of glue, wholly different from the flexible stain which would remain if the fabric simply came in contact with pure serum. If the exudate has not been absorbed by the garments, but its watery portions have evaporated, we will find light, straw-colored, gummy crusts attached to the skin. As the exudation continues the crusts become thicker and thicker, until they are detached through their own weight or are purposely removed. This period or stage of exudation is an indefinite one. It may

cease after two or three days, or, on the other hand, be prolonged for weeks or months. After a time, however, the flow diminishes, the crusts lessen, become smaller, and cease to form, and Nature, more or less ably assisted by art, makes an attempt to cover the part with a new layer of horny epithelial cells. It may be weeks, however, before this effort is entirely successful. The change from the soft and succulent cells to those which present the characteristics of the superficial layer of the epidermis is supposed to be due to the development of a substance which has received the name *kerato-hyalin*. We may assume, therefore, that the last or healing stage of an eczema cannot be ushered in until Nature supplies the necessary material, or the inflammatory condition is so far reduced that it may develop in normal quantity. The process, however, is under all circumstances a gradual one, and attempt after attempt is made to develop a good horny layer without success, and the cells which have become partly cornified are, when matted together, but loosely attached, and exfoliate as small-sized scales, more or less branny in character. If the progress of the case is toward recovery, the new horny cells which are formed become more and more natural in character and aspect, until finally we have a complete regeneration of the epidermis and a return to the condition which existed before the attack. In eczema pure and simple we never have ulceration or loss of tissue as a direct result of the disease, and recovery takes place without the least trace of a scar. In some instances, however, the itching is so severe that the diseased parts are torn by the nails, and mechanically injured to such an extent that scarring, usually of a trivial character, may result.

For practical convenience the course described above may be divided into three stages, the first being that of *congestion and the formation of vesicles*, the second that of *exudation and crusting*, and the third that of *dryness and scaling*. This scaly stage has received the name of **eczema squamosum**.

It would be indeed fortunate if every vesicular eczema could be depended on to pursue without interruption the course we have indicated, but such is not always the case. On the one hand, a single patch of eczema may in a few days receive a companion, either near it or at some more distant point. These may progress together, or one of them may advance more rapidly on its course than the other. The amount of surface that is involved will vary in almost every case. In some patients we will find one or more patches, perhaps the size of a dollar, but in others the lesions may be much more extensive, covering in the severest cases the greater portion of the surface. But this is not all. The lesions may at one time appear to be progressing favorably toward the third or healing stage, when suddenly, without apparent cause, the inflammation may be again lighted up, and we have a return of the exudation and crusting,

a feature which is always disheartening to the patient and annoying to the physician.

Eczema Pustulosum.—In the pustular or second variety of eczema, dependent on the lesion, we may have a course and progress substantially similar to those which commonly occur in the vesicular. We first have the period of congestion, promptly followed by the appearance of minute, closely aggregated pustules. If we examine the exudation in the vesicular form under the microscope, we will find here and there a few leucocytes; but if we examine the contents of the pustules, we find a mass of them, but apparently a lessened quantity of the plastic element met with in the first variety. As the watery portions of the purulent exudation evaporate, crusts are formed of a greenish color. Now, between these two forms—namely, the vesicular and the pustular—we may have an indefinite number of transition forms, due to the greater or less proportion of leucocytes that exist in the exudation, giving rise to the varieties sometimes termed vesiculo-pustular. Why in one subject eczema should take on the vesicular and in another the pustular form, is a matter about which we might speculate indefinitely without arriving at any positive conclusion. Whether it be due to the inflammatory action being greater, or whether to the general condition or some idiosyncrasy of the patient, can not be definitely stated. This second stage of purulent exudation has no definite limit. It may, as in the form previously described, last a few days only, or it may be prolonged for weeks. In time, however, the inflammatory action diminishes. The exudate lessens in quantity, then disappears, and an attempt is made to form a new horny epithelium, but this change does not occur suddenly, and sometimes days or weeks may elapse before it is fully accomplished. Recovery, however, when it does take place, is complete—that is to say, the skin is restored to its normal condition without scar or cicatrix, except there has been mechanical wounding, as already alluded to.

The pustules, which are the early lesion of this form, are as rarely seen by the physician as the vesicles, owing to the fact that they have usually disappeared before the case comes under observation. Occasionally, however, both vesicles and pustules may be observed at the extending border of a lesion, or may be found when new lesions develop while the patient is under treatment.

Eczema Exfoliativum.—In probably the majority of instances of acute eczema there is no formation of either vesicles or pustules, but instead an exfoliation over a considerable extent of the horny layer. The exudation which has left the vessels and is seeking a superficial outlet may loosen the horny epidermis over a considerable area. This loosened layer rapidly exfoliates, leaving a reddened, moist surface of greater or less extent. The exudation itself may be serous, sero-purulent, or puru-

lent, and the character of the crusts that form will of course depend on the character of the fluid. This second stage pursues the same course as has been described in the two previous varieties, and in its third stage—that of dryness and scaling—can not be distinguished from them. In other words, an eczema in the third stage gives us little clew to the manner and nature of its onset, so far at least as we can judge by appearances.

Eczema Papulosum.—Thus far we have dealt with lesions characterized by a more or less fluid exudation, which loosens the superficial portion of the epidermis and spreads itself over the affected surface. In some cases of eczema, however, the tendency to exudation is lessened, and the probabilities are that it is less fluid in its character, and under these circumstances does not gain the surface, but collects at points beneath the epidermis, raising little solid projections which have received the name of papules. These may be somewhat closely aggregated, or there may be an appreciable distance between them, and the surface will be dry unless the pruritus leads to scratching and the edges of the papules are torn. In that case a small quantity of lymph may exude and dry into minute scales. In the course of time, however, the papules themselves tend to subside, and we have a surface somewhat glossy and scaly, but not to the extent in the varieties previously described.

This papular form of eczema has its seats of election. It is perhaps never seen on the scalp and some other parts, but is quite common on the arms and forearms and thighs and legs, especially their flexor aspects.

Eczema Fissum.—There is still another variety of eczema in which we have neither vesicles, pustules, nor papules, nor the extensive exfoliation which characterized the exfoliative form. We may have a more or less reddened surface, but instead of the lesions already mentioned we find small cracks or fissures extending through the stratum corneum, and sometimes through the stratum Malpighii as well. The exudation in this fissured variety is slight, crusting is absent, and after a time the skin returns to the normal condition by a simple closing of the fissure and disappearance of the congestion. These fissures are perhaps more frequently met with behind the ears, on the palms and soles, and at the various flexures.

Eczema Erythematosum.—There yet remains another form which has only within recent years been recognized as a variety of eczema. I allude to the erythematous. It is characterized simply by a red and congested patch or patches of varying extent, unaccompanied by vesicles, pustules, papules, or fissures. Its almost exclusive seats are the face, palms, and soles, and in earlier times it would have been simply termed an erythema. It is usually met with in a subacute form, and when not checked by treatment tends to an indefinite chronicity.

Cases of eczema vary greatly in respect to the grade of inflammation

presented and the extent of surface involved. In some we may find great activity, accompanied by decided heat, high color, and other evidences of marked inflammatory action either in the first or second stages, or in both, and this activity may continue for a considerable period, and until the case prepares to enter into the third or reparative stage. In others, again, the natural color may be but slightly altered, the increase of general heat be almost inappreciable, and the general process partake of a subacute character from the beginning. In others, again, an eruption which is subacute may at any stage in its progress suddenly assume an acute character, and there may be frequent alternations of activity and comparative quietude. This is one of the most striking features of eczema, and one which should be always borne in mind, and it is well to warn the patient of the fact, in order that he may not prematurely rejoice at what seems to be a rapid progress toward cure under the treatment prescribed, for suddenly the trouble may relapse into its previous stage, often without apparent provocation.

The *duration* of eczema varies. In some cases it may run its course in a few days or weeks, while in others it may be prolonged for months or years, constituting the chronic form of the affection; or, again, there may be frequent relapses, even after complete disappearance of the individual attacks. When an eczema has lasted for a sufficient length of time to fairly entitle it to the appellation of *chronic*, we meet with certain features not encountered in the early stages of the acute forms. I allude more particularly to the infiltration, which occurs almost invariably in connection with localized patches upon the body or limbs, less frequently in eczema of the scalp, which, by the bye, is much more frequent in children than in adults. We also find it in connection with the erythematous variety on the face. These localized patches may have in many instances existed for months, and even for years, before they come under notice. This is not due to neglect on the part of the patient, but rather to the inutility of previous treatment, for these infiltrated eczemas are often exceedingly rebellious, and will yield only, as a rule, to a steady campaign, planned and carried out by one experienced in the treatment of the disease.

LOCAL VARIETIES OF ECZEMA.

Eczema of the Scalp.—The general appearances presented by a given eczema are greatly influenced by the location affected; certain locations, too, appear to exhibit a preference for certain varieties of lesions. Thus in eczema of the scalp, especially in infants and children, the process is commonly acute, with profuse lymph or purulent exudation, matting the hairs together in a tangled mass, offensive to both sight and smell. This exudation dries into crusts of a straw color or greenish hue, accord-

ing as the exudate itself contains a greater or less proportion of leucocytes. Not being as readily removed from the scalp as from the non-hairy portions of the surface, the crusts accumulate, and each day become thicker and thicker, until their bulk is such that they loosen and drop off. This is more particularly the case among the children of the poor, many of whom fancy that it is improper or unwise to meddle with the eruption. In a very large proportion of these cases, moreover, we find the eczema complicated with pediculosis. The pediculi capitis certainly seem to increase and multiply more freely and readily in an eczematous than in a healthy scalp, and the living insects, together with their eggs, give this form a noticeable and peculiar aspect; and if proper care and cleanliness are not practiced the scalp may become a mere mass of animated filth.

When eczema attacks the scalp in children it frequently extends to the face, and presents an active form of inflammation of the vesicular, pustular, or exfoliative type, accompanied by a good deal of heat and pruritus. If it extends behind the ears, fissures may form. The younger the child the more likelihood is there of an extensive involvement of the scalp and face. This is especially true while the child is nursing, and the tendency to it diminishes when it has reached an age which permits a more varied diet.

Eczematous inflammation of the scalp in young children is often complicated with the formation of small abscesses, and is almost invariably accompanied by enlarged post-cervical glands. The glands at the back of the neck swell, become tender, and sometimes suppurate, in strong contrast to the condition of the glands met with in syphilis, where we have only moderate enlargement without evidence of inflammatory action. Parents or others in charge of the child frequently exhibit more solicitude concerning the glands than they do about the eczema itself.

In adults, eczema of the scalp sometimes assumes the acute form, and, when it does, commonly involves the entire scalp, and we here find redness and exudation, almost always of a serous rather than of a purulent character. In the majority of cases, however, eczema of the scalp in adults appears as subacute localized patches without much exudation, and is commonly seen in the third or scaly stage, the previous stages either having been aborted or of but temporary duration.

Eczema of the Face.—Eczema of the face in adults somewhat advanced in years may assume the erythematous type, without other lesion, but in younger persons we may have ordinary acute eczema occupying any portion of the surface.

Eczema of the Palms and Soles.—When the palmar or plantar surfaces are attacked by eczema, we may have a purely erythematous lesion, characterized by a red, dry, and glossy surface, by which the natural lines of the skin are greatly exaggerated as to size and distinctness, and many

lines appear which are not noticeable in the normal condition. Scales are commonly absent, but fissures may form accompanied by slight exudation. This type of the disease is most common, and is usually subacute and chronic, but we may have an acute eczema of the hands and feet, accompanied by formation of vesicles. In consequence of the thickness of the horny epithelium on these parts, the vesicles do not easily rupture, but instead increase in size, and remain as vesicles until absorption of their contents occurs, when what was the summit of the vesicle separates as a small scale, leaving behind it a reddened point to indicate its previous site.

Eczema of the Genitals.—The penis and scrotum usually exhibit the erythematous form, unaccompanied by vesicles or scales; but when the lesion has persisted for any length of time, there may be a very considerable infiltration, leading ultimately to decided thickening of the scrotal skin.

Eczema of the Legs.—The inner aspect of the thighs and legs, as well as the forearms, are favorite locations of the papular form, although these lesions may be met with on almost any part of the body, and in rare instances on the face. On the lower extremities, below the knee, eczema is very commonly met with, and is often an indirect result of varicose veins; and if these latter have given rise to ulcers, a broad and diffuse zone of erythematous eczema will almost always surround them with scattered patches on the neighboring parts. The relation of the varicosus to the eczema appears to be this: When varicosus exists there is naturally a lessened localized vitality. The skin is not as well nourished as it should be, and is therefore more prone to any form of diseased action, and naturally would become, by preference, the seat of an eczema in a person predisposed to that affection. If the part be scratched, the weakened tissues readily become injured, and, lacking the normal powers of repair, degenerate into ulcers. Possibly a varicose vein may rupture or be torn with the nails, and then an ulcer is almost sure to form, which infrequently tends to a marked increase in size. The eczema, however, usually spreads some distance around the ulcer, and one half or more of the circumference of the leg and an equal proportion of its perpendicular surface may be involved.

Eczema of the Anus.—Eczema not infrequently appears about the anus, where it exhibits the erythematous form, accompanied by fissures which radiate from the center, and often extending to the mucous surface. When it has existed for any length of time there will be a certain amount of peri-anal infiltration.

Eczema of the Hair-Follicles.—Eczema may extend from the skin proper down into the follicular openings, especially those of the face and other parts, excepting the scalp. The surface eczema may be severe, or,

on the other hand, may play a very secondary part to the eczema of the follicles. The general surface of the patch, however, will be found red, perhaps dry or exuding, and, the inflammation having invaded the follicles, the lining epithelium will be found swollen and loosened. The hair-follicles are the ones most frequently involved, and when the hairs are extracted they come out, accompanied by their root-sheaths instead of being withdrawn with naked roots, as they would be from a normal follicle. Frequently the exudation which forms within the follicle comes to the surface, lifting the epithelium surrounding the hair, and forms a pustule (rarely a vesicle), pierced through the center by the hair. This deep-seated inflammation sometimes results in an extension of the action beyond the proper outline of the follicle, and nodules form, constituting a condition which represents one of the forms of sycosis. It must be distinguished, however, from the so-called parasitic sycosis due to the invasion of certain fungi and micro-organisms.

Eczema of the Sebaceous Glands.—The sebaceous glands may also partake of the eczematous inflammation to a greater or less degree. Under the stimulus of the eczema the glands sometimes exhibit increased functional activity, and the eczematous exudation becomes mixed with a sebaceous secretion, and, instead of a purely lymph or purulent exudate, we have some thin serum mingled with it, giving it a somewhat oily character, and the scales, when they form, show the fatty matter incorporated with them. This condition must not be mistaken for a totally different affection which has received the name of *eczema seborrhoicum*, which, in my opinion, is not an eczema at all or in any way connected with it. This so-called *eczema seborrhoicum* I have elsewhere described (*Practical Treatise on Diseases of the Skin*, 1891) under the name of *Sudolorrhœa*—a name given to the affection by myself, relying at the time on some German histological investigations which have more recently been shown to be untrustworthy, and the affection in question still looks for an appropriate designation.

We have thus far described the lesions or visible manifestations of the affection; but we must not overlook the equally important rational symptoms presented by this disease, as it is relief from these rather than from the eruption itself that the patient most frequently demands. When the eruption first appears, the local sensations are rather of a burning character and are not of any special moment; but after the rupture of the vesicles and the development of other lesions, pruritus becomes the striking feature of almost every eczematous eruption. In some instances the pruritus is mild, gives only slight annoyance to the patient, and demands little in the way of special treatment from the physician; but in the larger proportion of cases the pruritus is a factor that will not be overlooked by the patient, and must not be by the physician. In chil-

dren with eczema of the scalp or face the suffering is sometimes intense, resulting in a deprivation of sleep, constant irritability of temper, and, unless checked, making the patient a ready prey to other disorders. In adults a generalized eczema, if at all acute, may produce a degree of suffering that is almost unparalleled in any other disease; while even some of the local forms, as an eczema of the scrotum or anus, will curtail the patient's ability to sleep to an extent which has resulted in almost complete breaking down of the general health, and has perhaps been the causative agent of a subsequent insanity. In many other diseases the lesions may be of vastly greater importance as regards extent, malignity, and their direct ability to shorten life, and yet they will be unaccompanied by the tortures that sometimes afflict the eczematous.

Etiology.—It may be regarded as almost axiomatic, that the better we understand a disease the better we will be able to treat it; and this is especially true as regards the disease under consideration. Occasionally cases of acute eczema will be met with that recover under the simplest applications, and often under the influences of plain and nonmedicated protective dressing. Other cases, indeed, seem to run their course in a few days and recover without any special attention. Unfortunately, however, these cases are rare, and in the chronic forms it is often necessary to avail ourselves of every possible aid to recovery. A thorough appreciation, therefore, of all the causes of an eruption of eczema, both actuating and contributing, can not fail to greatly assist the therapist in the better selection of the remedial agencies applicable to a given case.

While it is true that little is absolutely known as to the etiology of eczema, we are yet in possession of many facts that have been observed in connection with the development of the disease to warrant certain inductions that in practice yield very satisfactory results. It is unfortunate, perhaps, that our real knowledge of the disease is so limited, as its etiology has been viewed from so many different standpoints, hardly any two writers agreeing even on the main points at issue. The modern German writers, following the example and doctrines of Hebra, give this branch of the subject but scant attention, denying in the main the influence of internal conditions as provocative of the disease, and stating that its causes must be looked for from without—in other words, that eczema is the result of some form of external irritation of mechanical, chemical, or thermic nature. For instance, Hebra would rub the skin with a dilution of croton oil, and, finding this followed by redness and small vesicle formation, would call this artificial affection thus produced eczema. Likewise other artificial eruptions, produced in a similar manner, received from him the same name. Now, no one of experience, excepting he adopts the view that the term eczema should be applied to a lesion rather than to a disease, would be willing to accept this dictum,

insomuch as the course, accompanying symptoms, and behavior of a generalized eczema resemble in no particular the artificial lesions referred to.

The French writers, on the other hand, appear to give an undue prominence to the constitutional causes, and undervalue the influence of external agencies. The two most learned and experienced French dermatologists, whose influence was especially felt some twenty-five or thirty years ago, were Bazin and Hardy. Their teachings were plainly in support of the constitutional origin of eczema. Hardy attributed this affection to an underlying hypothetical diathesis, which he termed the *dartrous*; while Bazin considered that most eczemas were due to what he named the *herpetic* and *arthritic diatheses*, the herpetism of Bazin agreeing very closely to the dartrous idea of Hardy, while the arthritic eczemas were, as their name implies, affections due to the same blood conditions which underlie rheumatic and gouty affections of the joints. Neither of these writers attributed much importance to external agencies as etiological factors. To the writer, however, the truth appears to lie between the German and the French views, and that eczema is an affection which in all probability arises in consequence of some unknown constitutional condition, and frequently brought into evidence by external irritation. In support of this proposition, we have the well-known fact that eczema, as a rule, appears many times in the same subject. When we meet with a case in a person at all advanced in life, we can almost always get a history of some previous attacks; while in a young person we can generally promise future attacks or outbreaks, and our promise will in most cases be fulfilled. Some will claim, in explanation of this, that the skin itself is so constituted in certain individuals that an eczema is more likely to appear than would be the case in others from the same exciting cause. I believe, however, that this is not altogether the case, but that the disease arises as a consequence of certain derangements or peculiarities of internal origin, and is often, and perhaps generally, brought to the surface and made manifest through some source of external irritation. In other words, two classes of causes, predisposing and exciting, are necessary for the production of the affection in the majority of cases. No form of external irritation known to the author is capable of exciting a true eczema in a perfectly healthy individual; *per contra*, the constitutional predisposition in a given case must be very strong indeed to be alone capable of causing an outbreak of the eruption.

In the writer's opinion, the fundamental cause of eczema lies in a constitutional derangement or diathesis, hereditary or acquired, of an indefinite duration. I believe, further, that it is directly due to the retention and accumulation in the blood of an undue amount of certain excrementitious substances, which under normal conditions would be removed by the kidneys or other excreting organs as fast as formed. When we

consider the complicated processes which are comprehended under the names digestion, assimilation, and disassimilation, and remember that at best we possess but an imperfect outline of the different changes which intervene between a morsel of food taken into the mouth and the diverse and complex forms in which it finally leaves the body, we are certainly not in a position to dogmatize as to the precise chemical changes which have taken place. We know, however, that after the various digestive juices have rendered the food fit for absorption, this food in its changed form enters the vessels and is conveyed largely to the liver, where it undergoes still further chemical changes, mainly in the direction of oxidation. Leaving the liver, it is conveyed to the various tissues for their direct nutriment, and having served this purpose, it is ready to be discharged from the organism. If, now, at any stage in this cycle, there be a hindering of the oxidizing processes, there will necessarily be an accumulation in the circulating fluid of substances which have not been rendered quite fit for nutriment, or, having served as such, have not undergone the changes which are necessary to render them fit for excretion. A single example of this may be cited in the history of the proteid substances taken into the body, and their final elimination under the form of urea. We know that if urea itself is unduly retained in the system, we will have symptoms of grave intoxication; and we also know that if uric acid, which is less highly oxidized than urea, accumulates in excess of the normal amount, other disturbances, less immediately serious, perhaps, will ultimately supervene. Now, besides these two bodies—urea and uric acid—the blood contains a very considerable number of others, all less highly oxidized than urea, but whose function or purpose has not yet been revealed to us. It will readily be conceded that if, from any cause, the processes of oxidation are curtailed, there must necessarily be an undue proportion of suboxidized products in the blood. Under these circumstances, the kidneys, which are the main excretory organs, will of course be called on to do more than their share of the work of depuration, and if they fail to do it there will be an excessive accumulation in the blood, and these suboxidized bodies may then very readily give rise to irritation of the skin, as well as of other organs. If, now, we accept the view, held by many, that the liver is the principal organ concerned in oxidation, we throw back the ultimate cause of an eczema to deficient functional activity of this organ, especially in its relations to oxygenation. Clinically, we have much to support this view, for in a large proportion of cases of eczema we will find more or less derangement of the hepatic functions.

The underlying causes of this hepatic derangement have yet to be looked into. In many instances, possibly in the majority, the trouble is congenital—that is to say, the patient is born with a constitution pre-

disposing him to the troubles we are now considering. If we look to heredity for a cause, we will be surprised at the very large proportion of patients who remember that one or the other of their parents suffered from eczematous, rheumatic, gouty, or asthmatic affections. They will tell you that either their father or their mother suffered from "salt rheum." On the other hand, there is no doubt that the eczematous constitution may be acquired, and the late Dr. Yandell wrote very strongly in favor of the view that malaria was the *fons et origo* of most cases of eczema. The fact that severe malarial attacks are almost always accompanied by congestion of the liver is well known, and where the malarial influence is prolonged this congestion may result in deeper lesions. While not quite willing to accept the dictum of Dr. Yandell in its fullest sense, I have made it a point to inquire as to previous malarial attacks, and have been surprised at the large number of patients who not only admit that they have had them, but who, of their own accord, accuse malaria as being the foundation of their ill-health.

Given the constitutional predisposition of eczema, the *local exciting causes* are numerous. A stimulating or slightly irritating poultice or lotion may excite an attack of the eruption at the seat of the application, and once started, the eruption may spread over a considerable surface that had not been directly exposed to the irritant. Undue exposure to the influence of heat, either solar or artificial, may provoke an eczema. Irritant dust or other particles accompanying certain mechanical operations or occupations may induce a like result. A pruritic eruption of any sort leading to scratching may also provoke a secondary eczema. This is notably the case in scabies. Vaccination, too, may be the starting point of an eczematous eruption, which may be local in its distribution, or, on the other hand, quite widespread. In the majority of cases, however, it will be impossible to ascertain the exciting local cause that precipitated the outbreak.

In some cases of eczema we will obtain a history of gouty troubles, which latter may be present when the eczema is absent, and *vice versa*, but I do not know that I have ever seen an acute gout and an acute eczema in the same patient at the same time.

When investigating the etiology of any given case, especially if the eczema is of long standing, or in a patient who has suffered from several attacks, one of our first duties should be to look into the condition of the kidneys. If, as previously stated, there is a surplus of excrementitious matter in the blood, the kidneys must do more than their ordinary duty in getting rid of it; and unless they do this, the accumulation tends to continue, and the very substances which, in the writer's opinion, tend to provoke an eczema, are likewise credited with a tendency to produce irritation of the kidneys themselves, especially that form

of kidney lesion which is characterized by chronic congestion, accompanied with exudation, and finally atrophy or contraction of the connective tissue—in other words, resulting in the condition known as contracted or small gouty kidney.

I can not dismiss the subject of etiology without calling attention to some views which have been recently advanced, to the effect that most if not all eczematous eruptions are of a *parasitic nature*, produced by some coccus or bacillus, which nobody as yet has claimed the honor of isolating. This view I can not accept. It is of course true that bacilli of various sorts can be cultivated from the discharge of eczema. It is likewise true that the exudation, especially when purulent, may be sufficiently irritating to excite an eczema in a portion of the apparently sound skin with which it comes in contact. It is also a well-known fact that eczematous eruptions are frequently promptly cured by remedial agents that are parasiticides, but this by no means proves that there is any specific bacillus or other micro-organism concerned in the etiology of this affection.

[Pathological Anatomy. (GEORGE T. ELLIOT.)—Eczema has been studied microscopically by various observers, among whom Biesiadecki, Simon, Kaposi, Robinson, and Leloir and Vidal may be mentioned. In acute eczema the pathological changes occur diffusely, or in a more circumscribed manner, as in the papular form, and they are primarily situated in the papillary portion of the derma, though they may later extend thence as far down as the fatty layer. They consist in a dilatation and congestion of the blood-vessels, a plentiful serous exudation, causing the œdematous swelling observed, and a diapedesis of white blood-cells. In addition, proliferation of the connective-tissue cells and dilatation of the lymphatic spaces occur. These inflammatory symptoms may be limited to a circumscribed portion of the skin, and result in the production of a papule which, according to Robinson, arises primarily around the follicles of the skin, especially the hair-follicles, or as a result, various changes occur in the rete. The fluid poured out penetrates into the intercellular spaces, and pushes the cells apart, producing an œdematous condition and subsequent destruction of the rete cells themselves. They undergo colliquative or dropsical degeneration, melt away, and form loculi of various sizes, which ultimately merge together into a single cavity, which contains a few free nuclei, fibrin, and coagulated serum. These rete changes constitute the vesicle of eczema, and if the cavity becomes filled up with leucocytes, it then represents a pustule. The vesicular lesion may arise in a different manner, however, and be unilocular, or represented by a bulla, which forms at the level of the stratum granulosum or of the basic horny layer (Leloir and Vidal). Numerous wandering cells will also be seen in the

intercellular spaces and karyokinetic division of the rete cells themselves. The formation of vesicles or bullæ may, however, be entirely wanting, and the exudative inflammation result only in the removal of the horny layer and a laying bare of the rete (eczema rubrum). The horny epidermis does not reform completely, owing to deficient keratinization, and the exposed rete may be in part destroyed and covered only by an amorphous coating of coagulated exudation and a few degenerated cells. In chronic eczema, the evidences of the inflammatory process are situated especially about the blood-vessels in the corium. The papillæ are, in addition, hypertrophied and lengthened, and may even attain a papillomatous size. The cutis is thickened, and islands of embryonic connective tissue are seen here and there. Abundant proliferation of the connective-tissue cells takes place, and masses of pigment may be present. The subcutaneous fatty layer may be invaded, and inflammatory infiltration occur between the fat cells and lead to their progressive diminution. The tissue becomes dense and attached to the skin, and, thickening occurring with lymphatic obstruction, elephantiasic changes may develop. The sebaceous and hair follicles undergo more or less degeneration and atrophy, and may even be completely destroyed. The sweat coils and their ducts may be atrophied in part and even entirely disappear.

In chronic eczema of the squamous variety, there is little change in the rete, but especially proliferation and desquamation of the horny layer.]

Diagnosis.—The extreme prevalence of eczema makes its correct and certain diagnosis of the first importance, and fortunately, as a rule, the diagnosis is easy. The history of the attack, the often multiple lesions and their progress as observed or as narrated by the patient, should not leave the physician long in doubt. To the experienced observer, however, this affection is almost always recognized at the first glance, no matter in what stage or under what phase it presents itself. The primitive congestion is rarely encountered, excepting when a fresh outbreak is threatened in a patient already under observation with previously existing lesions, and it is this latter accompaniment that alone enables the diagnosis to be made, as the erythema itself presents no special characteristics. If vesicles exist they can readily be distinguished by their minute size and close aggregation—a condition not met with in any other vesicular eruption, with the single exception of rare cases of sudamina. The vesicles met with in dermatitis multiformis, erysipelas, and erythema multiforme are larger in size and usually isolated from each other. In the various forms of herpes, as well as zoster, they are of considerable size, and usually met with in groups. In scabies, another affection in which vesicles are met with, we find them but few in number and

rarely to be observed, excepting upon the hands. In varicella we have also vesicles of some size, scattered over the surface and persisting for some days; while in variola the vesicles have been preceded by papules and will be succeeded by pustules, and the general symptoms which accompany this latter disease are in some cases sufficient to distinguish it from anything else.

The exudation and crusting met with in the second stage of the vesicular, pustular, and exfoliative forms can hardly be mistaken for any other disease, excepting that, when localized and of small extent, it is impossible to distinguish them from the lesions of *impetigo contagiosa*. In scabies, however, we meet with true eczematous lesions, induced undoubtedly by the irritation of the insect, and which tend to mask the pathognomonic features of the parasitic disease. The special localization, however, of the eczematous lesions about the hands, wrists, and some other parts should always put us on our guard lest we pass over the original affection—namely, the scabies.

A patch of dry and scaling eczema of the scalp in children may sometimes be mistaken for trichophytosis or ringworm of the scalp, and it may even be necessary in rare cases to resort to the microscope as an aid to diagnosis. In trichophytosis the hairs broken off near the surface of the scalp will usually reveal the parasite when present. In like manner eczema of the hair-follicles of the face should be carefully distinguished from trichophytosis or ringworm of the same parts. On the palms of the hands a scaly eczema may be mistaken for psoriasis, or even for a squamous syphilide, and occasionally we will meet with patches of eczema that very strongly resemble a true psoriasis, while psoriasis itself may sometimes counterfeit an eczema to an extent that will deceive the most experienced. In these cases of syphilis and psoriasis the history of the patient will enable us, in the vast majority of instances, to arrive at a diagnosis independent of the appearance presented by the lesion.

The papular lesions of eczema are to be distinguished from lichen planus, which is likewise characterized by well-defined papules.

Treatment.—In a disease which presents so many different phases as regards lesion and appearance—that occurs in all shades of general constitutional vigor or debility—that may be met with in connection with almost every other organic or functional affection, it is hardly to be expected that any one form of routine treatment will meet with frequent success. Such an expectation would be at variance with the known laws of pathology, and with universal experience in most other forms of disease.

In eczema, treatment will be successful just in proportion as every feature in each individual case is fully appreciated and its indications provided for.

The physician's duty in the management of a case of eczema is two-fold: He must remove the existing lesions as speedily as possible, and he must endeavor to so alter the general constitution or habit of the patient as to diminish and perhaps abolish the tendencies to relapse. As a rule, the former indication is the one most easily and readily fulfilled, while the latter may require months or years of constant attention. The one may be likened to occasional skirmishes that take place between two opposing armies, while the other more closely resembles the well-regulated campaign or the well-studied siege of a fortress. It not infrequently happens, moreover, that when the disease exhibits a chronic or persistent form, both modes of treatment must be brought into play before the affection will show the slightest indications of yielding.

The best hopes for success lie in a comprehension on the part of the physician of every detail connected with the causation and continuance of the eruption in a given case, combined with a knowledge of the therapeutic agents and agencies that experience has found to be most effective against it. It is these points that the author will endeavor to set forth to the best of his knowledge and ability.

The etiological questions in connection with the disease having already been discussed, it remains to indicate the therapeutic agencies that may be brought into play against the manifestations of the disease. This we may do under the following heads: Hygienic, etiological, diathetic, internal, and external.

Hygienic.—In exceptional cases of eczema, the patients present no obvious deviation from robust health and correct habits. They are hearty and strong, with good appetite and digestion; their bowels are regular, and their sleep is natural and refreshing. They have an abundance of wholesome food, with plenty of fresh air and suitable exercise. In short, from a hygienic standpoint, they appear to lack nothing. Under these circumstances the physician, naturally and fortunately, has nothing to change, and he must rely wholly on other means with which to combat the affection.

In most cases, however, this state of affairs does not exist. Among children, both of the rich and poor, insufficient or improper food may be the chief unhygienic condition. The mother's milk—the natural food of the infant—may be scanty and inferior in quality, whatever the social position or wealth of the parents. When this is the case, the nursling of the rich may perhaps take its nourishment from an alien breast, or be given some of the various milk substitutes and patent foods with which the market is flooded. The infant of the tenement house partakes not only of the mother's breast, if she has any milk at all for it, but also not infrequently also partakes of the parents' table, sharing with the older members of the family the customary beverage (tea, coffee, or beer), and

testing its toothless gums on crusts and indigestible food not suited to its age. The laborer's child of two or three years of age is fed on the ordinary food of the family, while the child of the rich is not infrequently stuffed with sweets and confections of all kinds. The remedy for these conditions needs no suggestion from the writer's pen, excepting that in every case of eczema in infants and young children the most searching investigation should be made of the kind and quality of the food that the patient is in the habit of receiving, and every effort should be made to improve this, when practicable.

Some years ago the writer investigated the character of the breast milk on which a considerable number of infants affected with eczema were subsisting, and in every instance it was found that there was a notable deficiency in the fatty matters—the milk, in other words, not being as rich in cream as it should have been. In these cases, for lack of more definite means, the fatty matter was extracted and determined by the ordinary chemical processes, or else less accurately ascertained by Vogel's optical method. We have, however, the command of a method of testing the milk for fat which is exceedingly simple, and which should be brought into requisition wherever any doubt arises as to the nourishing qualities of the milk furnished either by the mother or the wet-nurse. I allude to what is known as Babcock's test. If an ounce of the mother milk be furnished to the physician in a bottle, it will be an ample supply for the test in question, which is carried out in the following manner: A certain volume, say about half an ounce, is placed in one of the test-bottles that accompanies the Babcock apparatus, an equal quantity of sulphuric acid is added, and the whole gently mixed by shaking. The object of the addition of the acid is to dissolve the casein and enable the fat to be readily separated from it. At the same time the sugar of the milk becomes carbonized, and the mixture is of a dark-brown color. The test-bottle is then placed in a centrifugal and whirled for about five minutes. A little hot water is then added, and it is whirled again for a couple of minutes or so, which completes the operation, and the percentage of fat in the milk can be instantly read off by the graduate on the test-glass. In hospital work this apparatus should come into common use, not only for testing the milk of nursing mothers or wet-nurses, but also for testing the character and quality of the cow's milk supplied to the institution. The apparatus in question is commonly furnished with four or more test-bottles, which may all be operated at once, and the results obtained by it have been found almost, if not quite, as reliable as the gravimetric process of the analytical chemist.

When we find, by testing or otherwise, that the milk is not as rich and nourishing as it should be, through lack of the normal quantity of fatty matter, the indication is clear. The needed fat must be supplied in

some manner, either through a change of breast or the addition of cow's cream to the milk that is taken, or—what is frequently more convenient, and I believe equally efficient, if not more so—the addition of cod-liver oil. The effect of adding twenty, thirty, or forty drops of a good quality of oil to the breast milk, and giving it two or three times a day, is sometimes very striking, and it is my custom in the treatment of infantile eczema to use the oil, even where the infant appears to be plump and well nourished.

In more advanced life, the character of the food of those suffering from eczema should be carefully considered. My own experience leads me to recommend that only a moderate amount of albuminoid nourishment be given, and to make the diet consist in the main of bread, cereals, and vegetables.

Next after food, the question of fresh air demands our careful consideration. The children of the city poor commonly live and sleep in dark and unventilated tenement apartments, to which fresh air and sunshine rarely gain entrance. The child of the rich, however, on account of some supposed delicacy, perhaps, is often confined to the house for days or weeks at a time during the cold seasons, for fear that exposure to cold or wet may bring on some serious ailment. Fresh air, therefore, and as much of it as is practicable, should be insisted on.

Among adults of the laboring class, ill-ventilated sleeping apartments appear to be the chief malgenic factor; while among the wealthy, too free indulgence in the pleasures of the table, especially as regards nitrogenous food and certain kinds of wine or malt liquors, with too little bodily exercise, is not infrequently the hygienic condition that needs most attention. If these facts are borne in mind, it is not a difficult matter to suggest the requisite changes that should be made in the patient's way of living. It is very much more difficult, however, to have these recommendations fully carried out.

It need not be urged that the clothing worn should be suitably adapted to the season. Not infrequently it will be found that the fault lies in excess rather than in deficiency in this respect. Children will be brought to you bundled up with flannels and wraps to such an extent that the body is being constantly kept in a sweat-bath, a condition by no means to be desired. Sometimes flannels or other woollen garments are the cause of the irritation, and when such is the case they should be separated from the skin by a thin undergarment of muslin or linen; and in many cases it will be found that there is a distinct advantage in substituting pure linen for the fabrics usually employed for underwear.

Fresh air and well-ventilated apartments should not be forgotten, and regular and sufficient exercise should be insisted on. As a rule, children need no urging in this respect. They will romp and play, indoors and

out, to a degree (if permitted) that will fully satisfy all Nature's requirements. With adults, however, it is different, and many, if not most, cases of chronic eczema will be found in those who either will not or can not take sufficient exercise. Amendment in this respect is absolutely necessary. So long as exercise is taken, it matters but little in what way it is taken. Walking, rowing, or the gymnasium may be employed, according to the convenience of the patient; but probably one of the best means for all-round exercise is the bicycle, which of necessity compels the subject to be in the open air, and affords a mental diversion which replaces the tedium of the systematic constitutional, or the hour or two of forced gymnastic exercise. Some patients, specially men, will tell you that they get plenty of exercise on horseback. Perhaps they would if they had to fight the bucking broncho of the plains, but if they confine themselves to the ordinary well-trained saddle horse, it is the latter that gains most by the exercise. One patient, whom I recently advised to take more exercise in the open air, replied that he had plenty of it as it was, for every afternoon when the weather was suitable he drove his horse on the road.

Bathing sufficient to meet the requirements of cleanliness should be insisted on, but the too frequent or too profuse use of water is not advantageous. In persons predisposed to eczema, the excessive use of water, specially if accompanied by frictions, tends to promote the development of eczematous lesions; in other words, it is one of the local exciting causes. When eczematous lesions, however, exist, especially those belonging to the second stage of acute cases, it will be found that they are very intolerant of water. An eczema in this condition, with the horny epithelium removed, and exhibiting a raw and discharging surface, is always made temporarily worse by the application of water. The reason for this is obvious: the succulent cells of the Malpighian layer are exposed, and readily absorb water by endosmosis. They swell, and perhaps even burst, and the result is increased redness, tumefaction, and irritation. Water, then, should never be applied to a moist and exuding eczematous surface, even when the demands of cleanliness seem to render it necessary. If the parts be smeared with some mild oleaginous preparation—for instance, *unguentum aqua rosæ*, or the like—this may afterward be gently removed with a soft linen cloth, which will bring with it much of the dirt and exuviae that has collected on the skin. The irritant effect of water, however, may in a measure be controlled by the addition of a little glycerin or a small quantity of some neutral salt, as chloride of sodium, in the proportion of three or four grains to the ounce, in order to increase the specific gravity of the water until it about equals that of the serum.

These remarks apply to water simply as a cleansing agent, for water as a therapeutic agent fulfills a different and sometimes very useful rôle.

It not infrequently happens that very hot water—hot as it is possible for the patient to bear it—will cause immediate cessation of itching; while in chronic cases, with considerable infiltration, the systematic use (two or three times a day) of very hot water will be followed by the happiest results. Tepid water, or that which is only about the temperature of the surface of the body, will under these circumstances do harm rather than good. The water must be hot, and the most convenient way to apply it is to have a basin filled from a tea-kettle, and then to dip a handkerchief in this and apply it to the part. In from half a minute to one minute it should be removed and replaced by another, and these applications should be kept up for from five to ten and sometimes even fifteen minutes. These applications are often followed by the happiest results. In the absence of exuding lesions, a full bath of tepid water and a pound of sal soda added to it, taken at night, will generally exert a soothing influence and tend to produce sleep. In sluggish and chronic cases, ten or fifteen pounds of common salt added to a full bath will exert a stimulating action on the skin, and tend to promote a cure.

Etiological.—Having considered the general hygienic treatment, we should next study the etiological factors which are present in each individual case, so far as we are able to determine them. We may accept as generally true the old dictum, that when the cause is removed the effect ceases, due to *vis medicatrix naturæ*. To this, however, there are many exceptions, and we will not infrequently encounter them in eczema. A striking instance of this came under the writer's notice some time since. A nursing had been vaccinated seven months previous. The vaccination had pursued its usual course, but as it healed an eczema followed at its site, completely surrounding the point of inoculation, and at the time of examination it presented a circular patch of moist eczema about two inches in diameter. This had existed almost without change for about seven months. In this instance it was clearly evident that the vaccination was the local etiological factor, the eczema corresponding to the inflamed areola that originally surrounded the vaccine vesicle; but the eczema persisted, as stated, for many months after all irritation from vaccination had ceased. In many cases of eczema of the hands in washerwomen and scullions, excited by the frequent insertion of the hands in strongly alkaline water, the affection will often persist in the most annoying way, even after discontinuance of the practice that excited it. Scabies, likewise, is sometimes the exciting cause of an eczematous eruption, which may persist for a considerable time after every acarus has been destroyed. Many other local eruptions may excite an outbreak of eczema, and just in proportion as their influence has been prolonged will the eczema prove obstinate and unyielding.

In all cases careful investigation should be made for all possible causes

of local irritation, and the first care should be to remove them, if practicable, for, despite the exceptions noted, the general rule holds good.

Diathetic.—As we have already stated, the underlying cause of an eczema is a general condition characterized by deficient oxidation and sluggish action of the organs concerned in this process. It matters little at which end of the chain we commence, as the indications for treatment are clear, and frequently we are in possession of means by which they may in a great measure be fulfilled.

The blood is surcharged with excrementitious principles that should be carried out of the system more rapidly than the emunctories are at the moment doing; and the rational indication, therefore, is to stimulate these organs to a little extra duty. If the kidneys are in a normal condition they will readily respond to diuretics. Among these, acetate of potash, squills, caffeine, and drugs of similar character, have appeared to the author to yield excellent results. The alkaline diuretics, however, are the most important, and perhaps the best of these is the benzoate of lithia. This may be given in doses of from three to five grains in half a glass of water just before meals. The long continuance of excessive doses of alkalies, however, tends to deglobulize the blood, and consequently their administration should be interrupted from time to time, and hematogenic remedies substituted. A very convenient and suitable plan is to give some form of iron in connection with the alkali, or in alternation with it. The benzoate of iron is a convenient preparation for this purpose.

In patients advanced in years and presenting an acute type of the disease, it is important to ascertain the condition of the kidneys, for if there be any tendency toward disease of these organs the use of stimulating diuretics is strictly contraindicated. Depuration must then be sought through the medium of the skin and bowels, and laxative mineral waters appear to be the best agents to employ under these circumstances.

The skin may be stimulated to the performance of depurative functions, to a slight extent, by means of the diaphoretic action of heat, as in the regular Turkish bath, or by means of some home-made substitute. A very convenient domestic appliance may be arranged by seating the patient on a cane-bottomed chair, with a flat alcohol lamp or so-called "pocket stove" underneath. If the alcohol be then lighted, and a blanket thrown over the patient with the head exposed, profuse sweating will usually be apparent in from ten to fifteen minutes. In exceptional cases the diaphoretic action of pilocarpine may be appealed to, but the depression, and other disagreeable symptoms which sometimes accompany it, very greatly restrict the use of this powerful remedy. It is only in long-standing and very subacute cases, however, that profuse sweating should be encouraged, for in acute cases it will aggravate and increase the trouble.

In a very large proportion of long-standing and chronic cases of eczema hepatic torpor will be found present. This may be the result of old malarial trouble, and sometimes doubtless is due to hereditary predisposition. In either event this tendency must be combated and remedied, if possible. It is in these cases especially that properly directed exercise is of the utmost benefit.

Among the drugs useful in this connection are mercury and other cholagogues, and my custom has been to administer a smart purgative dose of calomel and jalap, or blue pill followed by a cathartic water. After the immediate effects of this have passed off, mild preparations of mercury in small doses, or some vegetable equivalent, may be continued for some days or weeks. Among the vegetable cholagogues, podophyllin in small doses may be used, but the writer prefers and commonly employs either boneset (*eupatorium*) or wormwood (*artemisia absinthium*). That polypharmaceutical monstrosity, Warburg's tincture, is also very serviceable, especially if malarial disease has antedated the eczema.

In considering the diet of eczematous patients, we have already advised that the supply of nitrogenous food should be limited, for we will find that many adult sufferers from eczema are decidedly carnivorous in their tastes. Men especially are particularly fond of the pleasures of the table, and indulge much more freely both in food and drink than there is any necessity for. As these matters are under the control of the patient himself, no pains should be spared to impress on him the necessity for a change in his habits, and to give him clearly to understand that unless he does make the requisite change you will not be responsible for a tardy and tedious recovery. It is not well to cut off the supply absolutely, but it should be very decidedly restricted, and it should be understood that eggs, fish, and fowl count as meat as much as beef and mutton do.

Patients often fancy that a diet of this sort would reduce their strength and incapacitate them for the amount of labor that their daily vocation necessitates. These fears are groundless, and on trial will soon be dissipated; and many patients will voluntarily inform you, after a few weeks' trial of the regimen we recommend, that their sleep is normal, their muscular system in better tone, and that altogether they feel themselves in a position to do more work physically or mentally than they were able to do before the change in their diet.

Specific Internal Treatment.—There are three drugs which appear to directly influence the course of an eczema when administered internally, in consequence of their specific action on the skin. Doubtless there are many others, but the writer can speak with very decided positiveness concerning arsenic, *calx sulphurata* (sulphide of calcium), and *viola tricolor* (wild pansy).

Arsenic.—The preparation of arsenic most in vogue is unquestionably

the liquor potassii arsenitis, the so-called Fowler's solution. This contains, besides arsenic, the compound spirits of lavender, which is a mixture of various ingredients that are certainly of no advantage to it. A simple solution of the salt in distilled water would be preferable. The liquor sodii arsenitis, however, is a simple solution in water. It is a modification of the old Pearson solution, and is to be preferred to the solution of Fowler. I much more frequently, however, use the arsenious acid in substance rather than a solution of its alkaline salts. When given in substance, it should be administered in a state of minute subdivision, which can best be accomplished by trituration with some hard crystalline substance, like sugar of milk, and then made into pills or tablets. The usual dose of arsenic in eczema varies within very large boundaries, dependent, on the one hand, on the age of the patient, and on the other on the character and condition of the eruption. It may in general be stated as being between $\frac{1}{100}$ and $\frac{1}{20}$ of a grain, while in exceptional cases as much as $\frac{1}{10}$ of a grain may be given with advantage as regards the eruption, and without injury or inconvenience to the patient. In children we would give a much smaller absolute dose than to adults; but it has been observed that children will bear relatively larger doses of arsenic in proportion to age than they do with many other drugs. The combination of arsenic with pepper, as in the old so-called Asiatic pill, will sometimes better agree with the stomach—that is, cause less disturbance there than the simple arsenic by itself.

The character of the eruption, or rather the acuity of the process, influences the choice or rejection of this drug, more, perhaps, than anything else. Arsenic, in appreciable doses, is a stimulant to the skin and exerts a specific action on it, and is itself capable of producing various eruptions. Manifestly, therefore, it needs to be handled with discretion. As a general rule, it may be stated that arsenic is positively contraindicated and harmful in acute eczema; but in subacute and chronic conditions it may sometimes—in fact, often—be employed to advantage. In the first stage of eczema it is useless, as it appears incapable of either aborting or shortening the duration of the attack when given at this time. In an acute eczema in the second stage, with exudation and crusting, it will almost invariably aggravate the eruption, increasing its extent and adding to the severity of the symptoms.

In the second stage of a subacute eczema, however, where the action, though persistent, is sluggish, arsenic in moderate doses is certainly of service. It may be given, at the commencement, in doses of one fiftieth of a grain, and gradually increased, and if the eczema seems to improve, its administration should be continued. If, from any cause whatever, acute symptoms develop, the administration of arsenic must be suspended, and when renewed be given in a much smaller dose than before.

In the third stage of eczema, without exudation and with dry, glossy skin covered with scales, arsenic exerts its greatest influence for good. Here the dose may be larger, and the longer the eruption has lasted the larger the dose, provided its administration is not accompanied by symptoms which would indicate that the drug is exerting its so-called physiological or pathogenetic action. The first indications that the limit of dose has been reached are irritation and catarrhal symptoms about the conjunctivæ, accompanied by more or less swelling of the lids. In addition there may be nausea or pain in the stomach shortly after taking the medicine. Occasionally, if the proper dose is exceeded, there will be œdema of the feet and ankles. When any of these symptoms appear the arsenic should be temporarily discontinued, and not renewed until they have entirely disappeared. The administration of arsenic in eczema and some other cutaneous affections should be guided very much by the rules which accompany the administration of mercury in syphilis—that is to say, give as much of it as can be comfortably taken without the production of phenomena indicating that the drug is no longer a curative, but has become a poisonous, agent.

During the administration of arsenic the urine from time to time should be examined for albumin, and if this is detected the drug should be discontinued permanently, as the integrity of the kidneys is of far greater importance than the speedy cure of the eruption. It must not be thought, however, from what has been stated above, that arsenic is of very frequent use in eczema, for this is not the case, as probably not more than one patient in ten will be benefited by it.

Calx sulphurata exerts a decided influence on eczema, and can be used to advantage in several different conditions. In cases of moist and inflamed lesions, with great soreness and irritation, it may be given in small doses of from one fiftieth to one twenty-fifth of a grain, and the more markedly the eruption is purulent the more decided the effect. It may also be used with manifest advantage when the patches are greatly infiltrated and the inflammation is subacute in character. Under these circumstances the dose to adults should be relatively larger—one fourth to one half a grain. In other words, the younger the patient and the more acute the eruption the smaller should be the dose, while the more chronic and sluggish the eruption the larger the dose.

Viola tricolor was in high repute in the last century in the treatment of eczematous affections, especially in the so-called *crusta lactea*, or eczema of the scalp in children. It has, however, received but scant attention during the past fifty years, excepting from French dermatologists. My own experience with it has been large, and covers a number of years, and the drug has certainly seemed to me to merit the encomium of its earlier advocates. The preparations most useful are the infusion and the fluid

extract. They should be prepared from a good quality of the imported herb, and the fluid extract should be made with dilute alcohol, as water extracts the virtues of the plant better than spirits. The ordinary cultivated pansy of the garden should not be used, but only the original wild variety, which, unfortunately, is not found in this country growing in its natural state.

Viola tricolor has a very decided action on the kidneys, increasing the flow of urine and the total quantity of solids excreted with it. It is possible, therefore, that a part of its effects are due to its diuretic and part to its depurative action. Other diuretics, however, do not seem to possess all the powers exhibited by this drug, and can by no means entirely fill its place. The odor of the urine undergoes a marked change, somewhat resembling that of the cat. *Viola* has a very wide range of usefulness in the disease under consideration, and this is especially true in *eczema capitis* of infants, and in most cases of vesico-pustular eczema of the scalp and face of moderate intensity but with persistent tendencies. In using this drug it is important that the dose be well adapted to the case in hand. Too small a dose will obviously be without result, while too large a one will make the eruption, for the time at least, very much worse, increasing the extent and severity of the lesions. The more acute the eczema the smaller should be the dose, while the more subacute and indolent it is, the larger it should be. In infants a single drop of the fluid extract two or three times a day is often sufficient; while in adults a teaspoonful may be given to those suffering from an indolent eruption. A favorite method with French physicians of administering *viola tricolor* is in the form of an infusion with senna. An ounce each of *viola* and senna leaves are put in a pint and a half of water and boiled until the fluid is reduced to a pint. Sulphate of magnesium may or may not be added to this mixture, and a sufficient quantity of it taken night and morning to produce three or four loose stools per day. A free purgation induced in this way is in many cases the best introduction to subsequent treatment.

The three drugs mentioned are the ones on which I chiefly rely in the treatment of the *lesions* of the disease, in contradistinction to the constitutional conditions which precede or accompany them. Both classes or methods of treatment may sometimes be pursued simultaneously, but which should be predominant or entirely omitted is a question which must rest on the judgment of the physician in each individual case.

Eczema may be complicated by forms of constitutional derangement other than those which properly belong to it. For instance, a patient may be markedly scrofulous or syphilitic; in either case the treatment appropriate to these special conditions should be taken into consideration. In other words, the treatment of these diseases should go on side

by side with the treatment of the eczema. As a rule, the strumous diathesis renders the eczema more prone to take on the pustular form; but I have never observed that syphilis modified the course of the eruption in any manner whatever.

Local Treatment of Eczema.—The local treatment of eczema involves the employment of various lotions, ointments, glyceroles, oils, plasters, powders, and soaps. A very formidable list of these might be given, but I shall confine myself in the main to those with which I have had favorable practical experience.

Lotions.—Of these, the well-known black wash, which I commonly have made about double the strength of the official preparation, may first be mentioned. It should be well shaken before use, and is applicable in the early stage of the acute form of the disease, when the primary congestion is present and the vesicles are about to form. Even after rupture of the vesicles, and during the second stage, black wash will often greatly modify the intensity of the inflammation and relieve the subjective symptoms. It is not advisable to apply it over too extensive a surface, for fear of mercurial poisoning. This accident, however, has never happened to me, but still its possibility should be borne in mind.

Of still greater value during the first and second stages of an acute eczema is a solution of peroxide of hydrogen. The official strength of this is what is termed the ten-volume solution, equivalent to about three per cent of the peroxide. If the surface be extensive, it is well to dilute the regular solution with two or more parts of water. In many cases its effect appears to be almost magical, reducing the purulent exudation and hastening the formation of the new epidermis. I have been familiar with the use of the dilute solution of the peroxide for many years, and was perhaps the first to employ it; but for about two years past I have used a very strong solution (twenty-five per cent, equivalent to seventy-five volumes) of the peroxide in ether. If the patch is limited in extent, a single application will sometimes abort it entirely. The pain, however, is very sharp, but as a rule rarely lasts more than ten or fifteen minutes. The patient will hardly complain of this, as the pruritus is relieved at the same time.

Hot water, as already noticed, is capable of reducing the congestion and relieving the irritation, and in chronic cases exerts a stimulating effect that results in diminution and removal of the infiltration.

Dilute alkaline preparations, especially a solution of carbonate of soda, are useful for cleansing purposes, and particularly for the relief of the pruritus. Strong alkaline preparations, such as liquor potassæ, green soap, and its tincture—made by dissolving one part of the soap in two parts of alcohol—should never be used in acute eczema, but they have a very distinct function to perform in the reduction of a thickened epi-

dermis in eczema of the hands and feet and in the removal of the infiltration. If a patch of greatly infiltrated eczema be painted with liquor potassæ, in a few moments little droplets of serum will be seen upon the surface. If these be wiped off, fresh serum exudes, and this continues for some minutes. When the tendency to exudation ceases, the parts should be wiped dry and a neutral or sedative ointment applied. The ordinary oxide of zinc ointment—or, still better, I think, about forty grains of the oxide of zinc to the ounce of lanolin—will form a very desirable protective dressing. The application of the alkali is repeated on the second or third day, according to the degree of irritation produced, and this is continued until several applications have been made. The result will be a notable reduction of the infiltration.

Ointments.—The ointments most in vogue are the unguentum zinci oxidi, unguentum hydrargyri ammoniati, unguentum hydrargyri nitratis, unguentum diachylon, unguentum picis liquidi, and ointments containing carbolic acid, salicylic acid, resorcin, etc. Until within a few years the basis of pretty much all the ointments was hog's lard, containing perhaps a small quantity of wax. For a few years, however, vaseline, or some similar preparation from petroleum, was very largely employed, and after that again lanolin, the oily matter extracted from sheep's wool, came into vogue. These various ointment bases can not be used indifferently. The unguentum zinci oxidi is simply a protective, and as such serves an admirable purpose, but it is probably inert so far as any direct medicinal effect is concerned. It is very serviceable as a protective, especially in cases of extensive eruption, where it would be neither safe nor prudent to employ the mercurial preparations. This ointment is usually made with lard as a base, but I very much prefer lanolin for this purpose.

Vaseline, or *petrolatum*, as it is termed officially, should not be applied to an acute eczema; at least I have usually found that it made it worse. The mercurial ointments above mentioned certainly exert a curative effect on eczema in the early stages, not by being absorbed, but by mere contact with the raw and exuding surface. This contact may best be maintained if lanolin is used as a basis. Vaseline is to be excluded for reasons above stated, and pure lard makes the ointment too thin, unless a very much larger proportion of mercury salt is used than is prudent. Personally, I prefer to employ a strength of from twenty to thirty grains of the salt to the ounce of lanolin. The best way, perhaps, to use it is to spread the ointment over a bit of old linen, apply it to the part, and retain it there with straps or bandages.

The unguentum diachylon is one of our oldest preparations, and was employed by the Arabian physicians, dating back to the time of Rhazes and Avicenna. The ancient formula has been modified from time to time, but the essential feature, namely, the mixture, and perhaps the

chemical combination of lead oxide with oil, remains as in the beginning. These ointments are all adapted to the early stages of the disease, and are of little or no benefit in a case accompanied by much infiltration, or when the eruption has passed into the third or scaly condition.

The unguentum picis liquidi, however, is often of great service in the third stage. This ointment should be made with lard, as should also be the case with carbolic acid and resorein. Carbolic ointment, from one to two per cent, often proves exceedingly soothing, and at the same time healing; but stronger than that, it should not, I think, be used in eczema.

The white precipitate ointment, to which a little stramonium may be added, has certainly proved in my hands to be a most effective curative agent in the early stages of the disease, but it should not be applied to a very extensive surface. Some years ago, in hospital practice, there were two patients in adjoining beds, both suffering from eczema, one of them extensively. For this patient the zinc ointment was prescribed, and for the other the white precipitate. Through some oversight on the part of the nurse the ointment-pots were exchanged, and the patient with the extensive eczema received a very liberal rubbing with the mercurial ointment. The result was a severe—in fact dangerous—salivation. I have occasionally known the white precipitate ointment to excite an intense dermatitis. In two instances I suspected the presence of corrosive sublimate, and had the ointment analyzed, with negative result.

When the ointments are to be applied to the skin it is of course presupposed that the crusts have been removed. In eczema of the scalp in children, it is well to saturate the crusts with olive or almond oil and put on a cap for twelve or twenty-four hours, after which the crusts can usually be removed without difficulty. The hair should then be cut as closely as possible, and for this purpose nothing is so convenient as the clipper employed by barbers. When the surface has been cleaned, and the application can be made directly to the inflamed parts, the ointment should be applied. One of the most convenient ways of using these ointments is by means of the ready-prepared salve-muslins originally introduced by Dr. Unna, of Hamburg, but now prepared by several manufacturers. A somewhat similar preparation is the plaster-muslin, which has a firmer consistence, and will usually remain where placed without the necessity of a retention dressing. The frequency of the application or of the dressing will depend in a great measure on the amount of the discharge. Sometimes the applications will require renewal night and morning, and sometimes only once in twenty-four hours. As a rule, the parts should be disturbed as little as possible, and the dressings removed only when necessary. Most patients—and I fear many physicians also—have the idea that the cleanliness to be obtained by a liberal application

of soap and water is important. This is not the case; in fact, it should be dispensed with as much as possible.

The unguentum picis liquidi has rather gone out of fashion, having been replaced in great measure by ointments containing oleum cadini, oleum rusci, and similar empyreumatic substances; but I have never been able to satisfy myself that they were any better than the old-time tar. It is important to rub the tar ointment well in with the fingers, and this preparation is especially adapted to a scaly eczema in the third stage, unaccompanied by marked infiltration. In fact, infiltration is a contra-indication to its use. This must be reduced before the tar ointment is applied.

Collodions.—Contractile collodion will sometimes avert a threatened eczema, and prevent extension from one already existing, if applied around the margin of the lesion. Cantharidal collodion is usually employed as an application to an old and obstinate local patch, which it is desired to stir up to some degree of activity. Occasionally it hastens a cure; more frequently it does more harm than good. Collodion containing five per cent of iodine will often prove of service in chronic thickened patches, while collodion with three or four per cent of salicylic acid will dissolve and remove thickened epidermis on the hands and feet more quickly, perhaps, than any other substance. It can not be used of greater strength than this in collodion, from its tendency to solidify, and where a strong ten or twenty per cent solution of salicylic acid is desired, it should be incorporated in a plaster for application. Salicylic acid should never be used during the second stage, when the epithelium is absent, as it tends to prevent the cornification of the new epithelium. Moreover, its use at any time should never be continued after a thickened epidermis has been reduced.

Traumaticin.—Traumaticin is the name in common use to designate a ten-per-cent solution of gutta percha and chloroform. This preparation was official in the last Pharmacopœia, but from the present one (1893) it has for some inscrutable reason been omitted. It is in most instances a more suitable vehicle than collodion. It may be used in connection with oxide of zinc, ammoniated mercury, and a number of other substances.

Gelatin.—Gelatin, softened in water and heated with glycerin, has been used as a basis for the incorporation of the various drugs applicable to the treatment of eczema. It should be a rather stiff jelly when cold, and to be ready for use it should be liquefied by heat and painted rather thickly on the parts. It can, of course, only be used conveniently where patients are confined to bed. It is very highly recommended by some, but personally I have never been able to discover any distinct advantage in its employment.

Powders.—It is sometimes found that in the second stage of the dis-

case ointments and lotions of every kind increase the irritation and add to the discomfort of the patient. Fortunately, these instances are rare, but when they are met with simple or medicated powders will sometimes prove of service. Starch, lycopodium, ordinary toilet powder, or talc may be used alone, or the oxide of zinc or subnitrate of bismuth may be mixed with any of them, and sometimes a minute quantity of carbolic acid will improve them. Quite recently a manufacturer has placed upon the market a stearate of zinc in powder form, combined with a little salol. This I have found to be a most admirable preparation, both in eczema and in some other cutaneous affections. There is still another recently introduced drug which is destined to become a very useful agent in the treatment of eczema, especially in the subacute form, with infiltration. I allude to gallanol. It may be used in the strength of ten to thirty grains to the ounce of simple powder, or may be made into an ointment with lard (not lanolin), or may be applied in traumaticin.

Soaps.—Soft potash soap, equivalent to the *sapo viridis* of the Pharmacopœia, contains an excess of alkali, and is used for the reduction of infiltration. It should be thoroughly rubbed in with the aid of a piece of flannel moistened in hot water until a lather is formed. This should be left on, and its effect is similar to that of liquor potassæ, already noticed. Hard soda soap prepared for laundry use also contains considerable free alkali, and may be used for the same purpose. Tar soap is of service in the third or scaly stage of the disease. During the past two or three years manufacturers have placed upon the market soaps containing all manner of medicinal ingredients. I have never found any special advantage from their use.

Certain mechanical means are sometimes employed in the treatment of eczema. A few years since, wrapping the affected parts in sheets of vulcanized rubber was much lauded, especially in eczema of the hands, with the view to keeping the parts moist and macerating the thickened epidermis in the secretions of the parts. This method is sometimes useful. The application of rubber, however, in the form of an elastic bandage, often proves of the greatest advantage in thickened eczema of the lower extremities. The object here sought is steady pressure, with a view to producing absorption of the infiltration. The silk elastic stocking may be used for the same purpose.

Sometimes localized patches of eczema of long standing fail to yield to any of the ordinary means for their relief, and require still more vigorous interference. In this connection scarification is very useful, and patches of thickened eczema will sometimes disappear as if by magic after the use of the knife. I have even met with cases, however, in which this was not sufficient, and I have been forced to scarify with the cautery knife. It should be applied at a bright red but not white heat, and the

entire thickness of the skin cut through in parallel lines, which are afterward crossed.

Electricity will sometimes, though not always, remove the infiltration of eczema. So far as my own experience goes, the faradic current is of no service; but the constant current, applying the negative pole to the diseased part and the positive pole elsewhere, will sometimes prove efficient.

One of the most distressing features of many cases of eczema is the intolerable itching that frequently accompanies the disease. It is the symptom of which the patient complains the most. An application that will in all cases remove this annoyance has long been sought, but, unfortunately, has not yet been found. In the minority of cases only is it possible to completely subdue the pruritus, but in very many a certain measure of relief may be afforded. Twenty or thirty grains of chloral and camphor rubbed together, and incorporated with an ounce of simple ointment, may be used in subacute and nonexuding cases. Three to five grains of carbolic acid, twenty or thirty of balsam of Peru, twenty or thirty of menthol, a drachm of the fluid extract of stramonium, or a quarter to a half grain of corrosive sublimate to the ounce of ointment, may be tried in turn, with the expectation of affording some relief. As a general rule, however, the pruritus ceases when the eczema gets well, and not before.

Treatment of the Special Forms and Varieties of Eczema.—

Bearing in mind the general principles that underlie the treatment of all cases of eczema, we will consider the special varieties as influenced by a large degree of inflammatory action, locality, etc.

Eczema Capitis of Infants.—In eczema of the scalp in children, we frequently, and perhaps generally, find the case acute as regards its character, though it may be chronic as regards the duration of time that it has existed. It is almost always presented to us in the second stage, characterized by exudation and crusting, and complicated with enlarged glands at the back of the neck, small abscesses of the scalp, and perhaps also accompanied by pediculi. The vesicular and pustular forms are the most common, and the crusts entangled in and retained by the hair accumulate more quickly than elsewhere. In dispensary practice the scalp often seems a mass of animated filth, fetid and disgusting to an extreme degree. The first thing to do is to cut the hair off as short as it is possible with the scissors. If pediculi are present, thorough search should be made through the hair-stumps for their ova, which should be removed; otherwise they will continue to hatch out. If many crusts adhere to the scalp after clipping the hair, saturate the parts with sweet oil, and after a few hours give the scalp a good washing with soap and warm water. After thorough drying apply zinc or diluted white precipitate ointment. The

ointment should be applied thickly, and renewed daily, or even twice daily, and the accumulations of old ointment may be removed by the gentle use of the comb as often as is necessary. The scalp should not, however, be washed again for several days; in fact, the less frequently it is washed the better. If abscesses are present, they must be opened, and perhaps poulticed for a day or two.

Eczema of the scalp in many cases seems to be called into existence as a consequence of parasitic irritation, and when the eczema itself is of but limited extent and the parasites are numerous they may be made the first point of attack, and cutting of the hair avoided. I know of no more effective means of getting rid of them than the application of staphisagria, or drowning them out with ordinary kerosene. If the hair be thoroughly saturated with this for two or three days in succession, soap and water, a fine-tooth comb, and patience will do the rest. The parasites destroyed, the eczema may recover spontaneously, or more quickly if aided by a few applications of an appropriate ointment.

In general eczema of the scalp, attended with a high degree of inflammatory action and a tendency to suppuration, sulphide of calcium is probably the best internal remedy that can be made use of, administered in accordance with the rules already given. Later, *viola tricolor*, especially in subacute cases of long standing, will prove useful. The enlarged glands at the back of the neck, if they show no tendency to suppuration, require no special attention. When the eczema gets well they will subside. Eczema of the scalp often extends to the forehead, face, and ears. If fissures form behind the ear, it is well to add a little finely powdered graphite to the ointment.

As the case progresses toward recovery and the exudation and crusting cease, and the third stage, characterized by dryness and scabs, is ushered in, the treatment requires a change. A little tar in some of its forms should then be added to the ointment, and the proportion of tar gradually increased as the improvement advances. If progress toward recovery should halt, a little more active stimulation may be the thing needed. If, however, the eruption should revert to the second stage, as not infrequently happens, the treatment appropriate to this stage will have to be resumed.

Eczema of the Scalp in Adults presents itself more frequently in a subacute than in an acute condition, and very commonly in the dry and scaly stage the patients complain of a certain amount of irritation and the excessive formation of dandruff. In this condition arsenic may prove of service, but the local treatment is of the chief importance. If the same condition should be presented on non-hairy parts, tar would be the first remedy thought of. This, however, is practically impossible on the scalp, excepting for those who are able to abandon all social and business pur-

suits. As a substitute for tar, I occasionally use a mixture of the following composition :

R	Ol. ricini	.	.	.	.	.	.	.	.	.	.	℥ ss.
	Alcohol	.	.	.	.	.	.	.	.	.	.	3 ijss.
	Ol. eucalypti	.	.	.	.	.	.	.	.	.	.	3 jss. M.

To this may be added, if the scaly formation is excessive, a small quantity of salicylic acid, say ten or fifteen grains to the ounce. The most convenient way to apply this mixture is from a small oil-can. If a parting be made through the hair with a comb, a drop of the oil is applied and rubbed in with the finger. Another drop is applied near it, and that rubbed in; and so on until the end of the parting has been reached. The comb is again passed through the scalp, a fresh parting made a short distance from the previous one, and this is oiled up as before. All the affected portions are gone over in this way. To make the application in the most thorough manner, patients will, of course, need assistance. In other words, very few persons will be able to make the application thoroughly by themselves. If care be taken, only so much oil as may be necessary is applied to the scalp, and the hairs, excepting those near the surface of the scalp, do not become disagreeably impregnated with it. This application should at first be made daily, but at the expiration of a week the intervals may usually be lengthened. If at any time the condition should revert to the second stage, with exudation and crusting, the oil must be discontinued, and white precipitate or zinc ointment substituted. Constitutional treatment should go hand in hand with the local.

Eczema Barbæ.—In eczema of the hairy portions of the face, the disease not infrequently descends into the hair-follicles, and especially involves the root-sheaths, and may be accompanied by considerable infiltration of the tissues between the follicles. The most frequent form is the pustular, each pustule being pierced by a hair. When the hair is extracted it is generally accompanied by the root-sheath, which is swollen and loosened from the follicle. It is of the first importance that an accurate diagnosis be made, and that this affection be not mistaken for trichophytosis.

If the eczema be purely superficial—that is, if the inflammation has not extended into the follicles—it may be treated very much as an eczema situated elsewhere. If, however, it is sycosiform in character, with infiltration and pustules, epilation must be performed. Every hair in the affected region must be plucked out with forceps. As a rule, they come out easily and without much pain, in consequence of the loosening of the root sheaths. The necessity for epilation will be apparent when we consider the fact that the loosened hairs, while remaining in the follicles, are to all intents acting as foreign bodies and thus tend to keep up the in-

flammation. After epilation, white precipitate ointment should be applied two or three times a day. Internally, one-tenth to one-fifth grain doses of sulphide of calcium are usually of decided benefit. In fact, this drug nowhere shows its power more strikingly than in sycosiform eczema. Eczema of other hairy parts—the axillæ, pubis, etc.—does not usually take on the sycosiform character, and epilation therefore is rarely called for.

Eczema of the Genital Region frequently presents itself as a chronic affection of the scrotum, and most of the cases I have met with have existed for years before consulting me. The parts will usually be found red, dry, and thickened, and often the seat of an intense pruritus. In long-standing cases we will commonly find decided infiltration and thickening of the skin. Of all the forms of eczema this is the one which, in my experience, is the most difficult to control. A well-known writer disposes of the question of treatment in the following words:

“The treatment of eczema of the genital regions and anus does not differ from that of eczema in general, except in so far as we must bear in mind the predisposing causes and endeavor to remove them, if possible.”

This general advice is good as far as it goes; but perhaps the most important of the predisposing local causes are the dependent position of the parts and their constant exposure to friction, to say nothing of the natural moisture. As these causes can not be conveniently removed, we must confine ourselves to a partial mitigation of their effects. This can be accomplished, so far as the scrotum is concerned, by a properly fitting and snugly applied suspensory bandage. The bag should be adjusted in such a way as to keep the parts as elevated as possible, and with as much pressure as can be conveniently borne, without, however, constricting the upper part so as to impede the venous circulation.

If there be much infiltration, the first effort should be toward its reduction. There are three principal methods by which we may seek to accomplish this end: First, by a few *scarifications of the scrotum*, permitting the parts to bleed freely, care being taken not to cut any of the larger veins. After scarification the patient should sit for some minutes in a warm antiseptic sitz bath, to encourage bleeding and exudation. After the parts are dried, a little tincture of benzoin or other antiseptic lotion may be sprayed over them and a suspensory applied. In a week or two the scarification may be repeated. The relief afforded by this is sometimes surprising. Many patients, however, have such a decided dread of cutting operations about the genitals that some other procedure must generally be advised.

The second means that we have at command is *galvanism*. The constant current applied daily or on alternate days will sometimes reduce the infiltration and relieve the itching. The testicle should be pushed well up, so as not to be in the course of the current, and the scrotum held

between two good-sized sponge-covered electrodes, and a current of from five to ten milliampères passed for five or ten minutes, the strength and duration of the current being regulated according to the susceptibility of the patient. The third method of reducing the infiltration is the one most commonly employed, and consists in the application of liquor potassæ. This should be mopped on with a small tuft of absorbent cotton wrapped around the end of a stick. The application should be made by the surgeon himself, and not intrusted to the patient. After its immediate effects have passed off, the parts may be dressed with zinc ointment and the suspensory adjusted. From six to a dozen applications, made at intervals of from four to six days, will frequently produce very marked reduction of the infiltration.

Eczema of the Penis sometimes accompanies eczema of the scrotum, but usually in a milder form. It may, however, exist alone, and if met with in persons past middle life, and especially if the glans and inner surface of the prepuce are involved, the presence or absence of glycosuria should be ascertained. If this condition is present, the parts should be carefully washed after micturition, if the urine comes in contact with them, and an antiseptic lotion applied. The general treatment should be that which is appropriate to the diabetic condition.

Eczema of the Vulva is rarely met with until the climacteric, or later. In some cases it is doubtless caused by irritating uterine or vaginal discharges, but perhaps in the majority it is due to glycosuria. In either case the preliminary treatment is clear, and the best local application in my experience is a dilute solution of peroxide of hydrogen.

Eczema of the Palmar and Plantar Surfaces, frequently accompanied with great thickening of the epidermis and with fissures, requires special treatment. The thickened epidermis must be removed mechanically with knife, file, or sandpaper. After all that is possible has been removed in this way, a five or ten per cent salicylic-acid plaster should be applied. After several applications of the plaster, it will be found that still more of the epidermis may be easily removed, and the applications should be continued until the epithelial hypertrophy has pretty much disappeared. If infiltration in the derma be present, liquor potassæ should be applied, taking great care not to let it get into the fissures if any exist. The fissures themselves should be dressed with graphite, and white precipitate or citrine ointment applied to the entire diseased surface. If, however, there be little infiltration or epidermic proliferation, tar or its equivalent is indicated if the surface is dry and scaly, while some of the less stimulating ointments should be applied if the surface is moist and exuding. I have, however, had the very best results in a number of cases by the use of the strong (twenty-five-per-cent) solution of peroxide of hydrogen, to which I have already alluded. I usually applied it at inter-

vals of three or four days, and under the use of this agent I have obtained amelioration more promptly, as a rule, than by any other application that I am familiar with. At best, eczema of the hands, if already chronic, is an exceedingly obstinate affection, and one difficult to relieve.

Eczema of the Leg is very frequently dependent on pre-existing varicose veins, and when such is the case is difficult to manage unless the diseased veins can themselves be brought under control. If the varicose condition be at all severe the general nutrition of the leg seems to suffer greatly, and a slight wound from scratching or other injury may degenerate into an ulcer. The cutaneous tissues which are the seat of the lesion, and for a considerable space around it, may be greatly thickened, and the surface present a bluish tint from impeded circulation. When this condition exists the utmost benefit will be secured from the systematic use of the rubber bandage applied so as to bring firm but even pressure to bear upon the parts. The bandage should, in the first instance, be applied by the physician, and the mode of its application taught the patient. When practicable, it should be applied morning and night, and if it becomes soiled by discharges of any kind it should be replaced by a fresh one, while the first is permitted to soak in cold water until again needed. After the leg has been restored to its natural size the bandage may be discarded, and an ordinary elastic stocking should be worn habitually. The direct remedial applications to be made will depend on the stage of the eruption and the condition of the lesions. Incidentally, I may state that I have seen varicose eczema improve greatly from the use of the bicycle, due undoubtedly to the increased stimulation of the circulation.

Eczema of the leg, however, is not always of varicose origin, but sometimes presents itself as a chronic, subacute, circumscribed lesion, with or without much infiltration. If scaling be a notable feature—that is, with decided epidermic thickening and proliferation—a few applications of salicylic acid will prove of great service as a preliminary measure in the form of a ten or fifteen grain solution in flexible collodion or in plaster. If there is but little infiltration, tar or some of its preparations is indicated; but if infiltration is marked, potash or scarification should be employed, and afterward zinc or white precipitate ointment.

Acute eczema of the leg requires quite different treatment. If the greater part of the limb or both limbs are involved, rest in bed or on the lounge, with the limbs elevated, is a *sine qua non*. The parts being inflamed, hot, red, swollen, and exuding, need rest and soothing treatment. Absolute rest must be insisted on, and, when secured, apply suitable lotions, such as black wash, lead, and opium, or a diluted solution of peroxide of hydrogen. This latter agent is sometimes almost magical in its effects. The best method of applying it is with an atom-

izer. Purulent exudation is brought under immediate control and offensive odors are destroyed. In two or three days, as a rule, the inflammation will be lessened, the area of denuded surface diminished, and attempt at healing be apparent. When the eruption has reached this condition the peroxide should be discontinued and an ointment be applied, or, better, as I think, some of the medicated salve muslins which can now be readily obtained. These may be left undisturbed for several days, and if covered with an elastic stocking the patient may be permitted to take moderate exercise. If no indiscretion be committed, steady progress toward cure may usually be expected.

Eczema of the Inner Surface of the Thigh not infrequently appears in the papular form, and it is my present custom in these cases to first make applications of the strong peroxide solution, following them with zinc or white precipitate plasters.

Eczema of the Anus is an insidious affection, and frequently of long standing before it is brought to the notice of the physician. The skin about the anus will be found more or less thickened and puckered, and fissures sometimes extending to the mucous membrane within the rectum may complicate the trouble, thus adding materially to the discomfort of the patient. The infiltration is best treated, I think, by scarification, using either the cold or the hot knife. The fissures should be touched with peroxide of hydrogen, or perhaps with the actual cautery, and graphite ointment or powder be applied. After the infiltration has been wholly or in great measure removed, one of the usual ointments or toilet powder, to which a little zinc, subnitrate of bismuth, or white precipitate of mercury has been added, should be applied.

Eczema of the Mammæ and Nipples is a very frequent accompaniment of scabies in the female, and when met with the latter should be suspected and sought for, and the scabies, if present, receive the first attention. It must be remembered, however, that there is a malignant mammillitis, commonly known as Paget's disease, which must be differentiated from true eczema. The affection described by Paget will not yield to the simple treatment appropriate to an eczema, but demands most energetic measures.

In obese persons an eczema may arise from an irritation produced by the confinement of the cutaneous secretions by overlapping folds of skin, as in pendulous breasts and in the groin, between the thigh and the scrotum. In these, simple dusting powders, combined with a mild antiseptic, after a separation of the parts by the hand, will often accomplish all that is required. Among the dusting powders which I have found most useful for this purpose are the stearate of zinc, with a little salol, or a mixture of one part salol, two parts talc, and three parts rice powder.

DERMATITIS REPENS. (S. POLLITZER.)

Several cases of a peculiar form of dermatitis are described, under the above title, by Crocker (Diseases of the Skin, second edition, page 180). The same writer announced a paper on this subject to be read at the International Dermatological Congress at Vienna, 1892; but the transactions of that congress have not yet been published, and in the brief abstracts which have appeared I find no mention of Crocker's paper. The following description is based wholly on the article in Crocker's text-book. I have had the good fortune to see two of the cases referred to in that work.

Symptomatology.—The disease is almost always limited to one upper extremity, and there is commonly a history of some injury from which the affection appears to date. In one case it commenced on the border of an amputation wound of a finger; in another it started from a burn on the finger from melted sealing-wax; in another, a splinter run under the nail appeared to be its starting point. The disease may be limited to a single finger, or may involve the entire arm. It is of extremely chronic development, spreading very slowly and irregularly, lasting for months, or even years. The surface of the affected part is denuded of epidermis, red, moist, and free from granulations, resembling the surface of an *eczema rubrum*. The border of the patch presents a most characteristic appearance; it is quite sharply defined, irregular in outline, sometimes serpiginous or reniform, and occupied either by a crust or by pockets of pus formed under the undermined epidermis. The process extends by the undermined epidermis breaking down while the superficial burrowing of pus continues. The peculiar manner in which the disease creeps onward has suggested the epithet *repens*. Sometimes while the disease is spreading at one side it is healing at another, and the process may still advance even after the greater part of the affected area is covered with new epidermis. The new skin, however, retains for a very long time a red, glistening, thin appearance.

The following, taken from Crocker, may be looked upon as a typical but rather severe case: A lady, aged twenty-eight years; general health not good—weak, nervous, dyspeptic. The eruption began, about six months before she was seen, on the flexor surface of the wrist, with a crop of red papules, which coalesced and discharged. The eruption then spread down the hand and up the arm, while the oldest part gradually got well but remained very red. The border of the patch was well defined, and covered with thick, dirty-looking crusts at its upper part, while at the lower the skin was undermined. The rest of the surface, though very red, was almost dry. In four months it spread from below

the elbow up to the middle of the biceps; four months later it had traveled all up the right arm, across the back of the neck, and down the left arm to the elbow, the older parts healing. After many attempts the case was finally cured.

Crocker's view of the disease is that it is a dermatitis which "starts as the result of a peripheral neuritis, generally set up by an injury often quite trivial; and since antiseptics are generally eventually successful, it is probable that secondary parasitic invasion tends to produce extension of the disease." It seems to me, however, that the course of such a case as the one outlined above completely negatives the idea of a peripheral neuritis, and that parasitism is the fundamental factor in the process.

The **diagnosis** offers but little difficulty. Eczema is the only disease with which it could be confounded; but though the red, moist surface may resemble eczema, the sharply defined, undermined border is quite characteristic of dermatitis repens. The chronicity, the slow but steady peripheral extension, and the absence of itching are points of importance.

Treatment.—All the cases recorded have proved themselves strikingly resistant to treatment. So far as any general principles may be deduced from the few cases observed, the best results may be expected from the use of antiseptics under some form of occlusive dressing. Lactate of lead continuously applied cured one case; a ten-per-cent solution of permanganate of potash, painted on three times a day, cured another. Sulphate of copper, nitrate of silver, salicylic acid, iodoform, etc., have been of use in some of the cases. Internal specific treatment has no effect.

DERMATITIS SEBORRHOICA. (GEORGE T. ELLIOT.)

Synonym: Eczema Seborrhoicum (Unna).

In 1887, Unna made public his original conception of that process which has since become known as *eczema seborrhoicum*. According to him, it is composed of certain clinical phases of disease hitherto regarded as distinct entities, but which in reality are intimately connected upon nosological, pathological, and histological grounds. He thus includes in the one disease the well-known pityriasis capitis, faciei, barbæ, etc., seborrhœa sicca of the head and various portions of the body, seborrhœa corporis of Duhring, certain chronic and squamous and weeping eczemas of the scalp and of other surfaces, which had not been preceded by a period of vesiculation, and lastly many cases of so-called psoriasis.

While agreeing almost altogether with Dr. Unna's claims in regard to his *eczema seborrhoicum*, still, after careful consideration, I would depre-

cate the name *eczema* attached to it. It is unquestionably a form of cutaneous catarrh, and belongs in the same family of disease as *eczema* does; but yet its clinical symptomatology is so different from that generally attributed to *eczema*, that a distinction, at any rate in name, would be advisable. For that reason, I would use here the term *dermatitis* in treating of the disease, qualifying it by the addition of *seborrhoica*, owing to the fatty element so frequently seen in association with its lesions. In other words, I think the name *dermatitis seborrhoica*, given by Crocker to one phase of the process, is a very suitable one for the whole disease.

Definition.—*Eczema seborrhoicum* of Unna is an inflammatory disease of the skin, catarrhal in nature, and caused by micro-organisms—a parasitic dermatitis. It is characterized by its primary seat being the scalp, whence it tends to progress downward, occupying certain localities by preference, though not exclusively. It is thus found over the middle portion of the face, in the sternal and interscapular spaces, in the axilla and inguinal regions most frequently, but all other portions of the body may be affected. Its lesions are of various forms, aspects and character—scaly, moist, and crusting—and in many instances, they present evidences of a fatty hypersecretion, owing to a participation of the fat-producing glands in the process.

Symptomatology.—In giving the clinical description of *dermatitis seborrhoica*, I shall confine myself to my own experience and investigations based upon over fourteen hundred cases, and I would divide the features pertaining to the process into two portions: (*a*) those general symptoms and characteristics presented by the disease and relating to all its manifestations; and (*b*) those special ones due to its occurrence on particular localities of the body.

(*a*) **General Symptoms.**—With scarcely an exception, *dermatitis seborrhoica* begins on the scalp and especially over the vertex. It may remain localized there, but more often it extends either over the temporal regions to the ears, or it appears along the margin of the hair upon the forehead, or it develops on the face, particularly over its middle portion—the interpalpebral space, the nose, and the neighboring portions of the cheeks. In the large majority of cases, its manifestations are situated above the clavicles; but the sternal, the interscapular, and the inguino-scrotal regions are also its favorite sites, while in a lesser degree the axillæ and umbilicus are affected. All other portions of the body may, however, be attacked, and the process may appear on the extremities, the hands and feet, the vermilion border of the lips, and in the auditory canal. In some exceptional cases, the disease may become universal.

The extension of the process may occur in a uniform manner, and, being present on the scalp, the face, the sternum, etc., may become successively attacked; but more usually, it follows an irregular course, appear-

ing over the sternum or on some other portion of the body distant from the original seat of the disease. In its extension, it may follow a rapid or a slow course. It may remain localized upon the scalp for months and years, and only then slowly begin to develop upon some other surface, or it may progress within a few weeks after its primary inception. Rapid generalization may occur after a long period of stationary existence, and its slow and gradual course may be interrupted by sudden or acute outbreaks and extension over wide areas. The lesions representing the disease may be only few in number and discretely distributed here and there; or they may be very numerous, closely aggregated together, and even coalesce to form diffuse or other shaped patches. No tendency to symmetry is, however, shown in their arrangement. The clinical manifestations indicative of the process are of several grades. The slightest degree is represented by more or less extensive areas of diffuse scaliness, the skin being natural in color or slightly reddened. The squamæ may be very abundant and accumulate to form thick masses, which are dry, grayish-white and adherent; or, if there is a pre-existing or a consecutive seborrhœa oleosa, the masses are soft, yellowish to brownish in color, greasy and fatty, the follicular openings dilated, and the skin slightly or markedly reddened.

Besides appearing in these diffuse forms, the disease is characterized by superficial, solid, round or oval, yellow, pink, or yellow-red macules of various sizes, which are always sharply defined and delineated, no matter how irregular their contour may be. Or there may be small papules, which enlarge peripherally, or coalesce to form slightly elevated, disklike lesions; or, by progressive evolution at the periphery and involution of the central portion, circinate efflorescences develop, which later may become crescentic in shape or represent some segment of a circle, or, by union with others, form a wreathlike band. The existence of minute folds of the epidermis along the periphery of these lesions has been mentioned as pathognomonic of the disease, but I have not found that they were in any way a constant feature.

The desquamation of these macular and other manifestations may consist of only a few small, thin, epidermic scales, or they may be abundant, or they may be yellowish and greasy from an admixture of fat. They may also accumulate and form more or less thick, yellowish to brownish, soft, nonadherent, fatty crusts. The lesions may likewise become moist, either over their entire area or from a few small points, or present only an eroded and weeping periphery inclosing a dry, scaly, or glistening center. Vesicles and pustules are not met with in the process unless secondarily produced. An attack of the disease is not limited to any single form of these various manifestations, but by gradual or rapid evolution they may all coexist at the same time and on the same indi-

vidual. Especially the squamous variety is seen, however, while the crusting and moist forms are more infrequent. The subjective symptoms are not, as a rule, marked. They are limited to slight itching, particularly when the patient is heated and perspiring. Frequently no itching is mentioned, and only occasionally is it severe.

(b) **Dermatitis Seborrhoica of Special Localities.**—*Scalp.* The vertex is most usually affected, but the entire scalp, especially in women, may be its seat. The clinical symptoms most frequently presented consist in a more or less abundant, diffuse, furfuraceous scaling of a whitish or grayish color. The lowest layers are quite adherent, and the skin is pale, lusterless, and dry (*pityriasis capitis*). The production of squamæ may, however, be excessive, and they accumulate to form thick, adherent masses, which encircle the hairs with sheathlike prolongations (some forms of *seborrhœa sicca*). In both of these stages the hair is dry, lusterless, and dusty-looking.

Owing to an admixture of fat, the scales may, however, be softer, fatty, and present a granular aspect; or, if the *seborrhœa oleosa* is marked in degree, the coating over the scalp is soft, yellow to brownish in color, greasy, and easily removed, while the hair is glistening and oily (*seborrhœa crustosa*, *croûtes graisseuses*, etc.). The same symptoms may be present in children as in adults, but in infants there are more often those soft, yellow, fatty, crumbly masses representing the milk crust as has been already described (*vide Seborrhœa sicca*).

The subjective sensations attending these symptoms are slight or marked itching, particularly when the patient is heated. They may persist unchanged for a variable period of time, and lead only to a falling of the hair (*alopecia pityrodes*, *seborrhoic*, etc.), or diffuse or patchy redness may develop, or small or large, red to yellow-red, sharply defined, round or oval, crusting or moist lesions may arise. Occasionally, circinate lesions or others representing some segment of a circle are seen, most usually over the temporal and parietal regions, and they resemble to some extent *tinea tonsurans*, except that the hairs are not broken off in the centers of the rings. The disease is not infrequently seen along the margin of the hair at the forehead and at the nape of the neck, appearing as a sharply defined red band of variable width, having a polycyclic contour, and either slightly scaly or covered with soft, fatty crusts. Sometimes its outline is broken, and only a number of bands of variable lengths and representing some segment of a circle are seen—*corona seborrhoica* of Unna.

Upon an already existing pityriasis of the scalp, diffuse, acute inflammation may supervene and extend over portions of the forehead, the temporal regions and the face. The redness is bright, the surface becomes covered with fine, fatty scales, and here and there moist lesions

may arise. In this acute form, the disease corresponds to the seborrhoeic dermatitis of R. Crocker, and to many eczemas of the scalp and face.

Besides the scalp, the process occurs on other hairy surfaces, as in the beard and the mustache, and on the pubes. Substantially the same symptoms occur as on the scalp, though alopecia of these regions is very unusual. In the eyebrows, pityriasis is more frequent, but the crusting form also occurs. Alopecia is not uncommon.

Face and Neck.—The clinical symptoms on these surfaces may also be diffuse, and consist of a pityriasiform desquamation occupying limited or large areas (*pityriasis faciei, seborrhœa desquamat. pityriasiformis*). More usually the middle portion of the face is affected—the interpalpebral space, the nose, especially the alæ, and the contiguous portions of the cheeks—but the entire face may present lesions of various shape and nature. The space between the eyebrows is often diffusely reddened, scaly and greasy. The alæ present similar symptoms, but crusting may also be marked, and fissuring at the naso-labial furrow may occur. The follicular openings are dilated and filled with fatty plugs. In some cases, there may be a marked incrustation of the entire nose, but in others, only a few sharply defined, red, scaly, or crusted macules may be present.

On the cheeks as a rule, round or oval, solid, rarely circinate, lesions are found. They are not elevated, macular for the most part, not infiltrated, of a yellow, yellow-red, pink or bright-red color, sharply defined, though irregular in outline, and usually only slightly scaly. Frequently dry, they are oftener greasy, and bear yellowish, fatty scales, owing to the presence of a complicating seborrhœa oleosa. Occasionally, they are moist in part or *in toto*.

The eyelids may present only a pityriasic desquamation along their margins, but more often the scales form masses encircling the eyelashes. Occasionally, the squamæ are yellow, soft and greasy. The eyelids are reddened and somewhat swollen along their borders. Alopecia is not uncommon, and I have seen slight superficial atrophy result, the eyelashes being entirely destroyed. (It corresponds here to seborrhœa sicca, many eczemas, and cases of blepharitis.)

The vermilion borders of the lips are sometimes affected. The lips are swollen, tense and uncomfortable. The surface is covered with large, more or less abundant scales, or thick, adherent crusts, which may be dark from admixture with blood. When removed, a smooth, shiny, or a moist, eroded surface is exposed. Fissuring is sometimes to be noted. Usually sharply limited to the vermilion border, the disease occasionally extends to the contiguous cutaneous surface, appearing then in the crusting form. The vermilion border of the lips is a rare location for the process, but since my first case, in 1887, I have had thirteen others under treatment. In every one, the implication of the lips had

been preceded by that of the scalp, face, etc. (*seborrhæa sicca* of the vermillion border, Besnier).

The ears are a frequent seat of the process. It appears behind them, extending more or less over the mastoid prominences, but it develops also in the conchæ and occasionally in the auditory canal. Posteriorly, the crusting and moist forms, accompanied by marked fissuring, are common. The disease extends from here downward to the cheeks and neck, and the resemblance to an irritation or other eczema is very striking, were it not for the absence of vesicles, etc., and the sharp definition and limitation of the affected area. In the concavity of the conchæ, yellow or slightly red, scaly and crusting macules are seen, but in the auditory canal there may be only scaliness, or small, moist patches, together with an excessive secretion of cerumen. The itching is usually severe and annoying.

There are no special symptoms met with on the neck, except in babies, in whom the disease simulates an intertrigo, but the lesions are generally dry, scaly, and represented by macules.

Chest and Back.—These regions are frequently affected. The lesions begin as small papularlike elevations, single or in groups, and capped with a small scale. The single ones enlarge peripherally, while the groups coalesce, and involution of the central portions of both taking place, circinate lesions result. Some portion of the periphery of these latter may undergo retrogression, and a lesion, crescentic, or representing some segment of a circle, remains. By continued peripheral growth, several of the circinate or crescentic efflorescences may meet and, coalescing together, gyrate and wreathlike bands and outlines may result. The central portions of the circinate lesions are scaly and dry, but more often covered with thin, yellow, greasy squamæ, and the same appearances are found in connection with the gyrate and other shaped lesions. The periphery is usually irregular in outline but sharply defined, slightly elevated, uniform and scaly, but frequently it presents small, excoriated, exuding points. Solid, round, or oval lesions are also often present, and these may be only slightly scaly, more often covered with soft, yellow, fatty crusts, and sometimes moist in a few points or over their entire area. There is frequently no subjective disturbance, but at times itching is severe. The process in these localities corresponds to the *seborrhæa corporis* (Duhring), *seborrhæa papulosa seu lichenoides* (Crocker), *seborrhée figurée* (Brocq), etc.

Axilla.—In the axilla, the disease occurs most often in the form of round or oval, red, superficial, sharply defined patches of various sizes, which show a tendency to peripheral growth. Owing to the moisture usually present, scaling and crusting are not observed to any extent, but exuding points are occasionally seen. On the other hand, circinate lesions

may develop and by their extension become wreathlike, and show a tendency to progress beyond the cavity of the axilla on to the pectoral wall, or posteriorly over the scapula. Crusting and scaling are then present.

Inguinal Regions.—The same symptoms as are met with in the axilla may exist in these localities, but I have more usually found here the disease in the guise of an intertrigo. It is common in infants, in association with some degree of the process on the scalp, and perhaps on some other portion of the body. The redness is diffuse, and shows a marked tendency to progress beyond the ordinary limits of an intertrigo, extending downward over a great portion of the thighs, the buttocks, and upward over the pubes. In adults, similar symptoms may be observed. The area is always sharply defined, polycyclic or irregular in outline, often slightly scaly, and sometimes of a glistening red and smooth. Progression takes place along the borders, but beyond the free margin, there will be several macularlike, red, scaly lesions, which, it can be seen, undergo likewise peripheral growth, and, meeting the advancing edge of the large primary patch, merge into it. The process by this mode of extension may cover, in a more or less diffuse manner, the thighs, buttocks, and the mons veneris and lower part of the abdomen. The skin is not thickened, except in adults, and as the result of scratching, and in these also crusting may exist. Similar intertriginous symptoms may be seen in the folds of the neck, etc., in babies, and under the hanging breasts in women. The disease may also extend to the scrotum, or over the labia and the perinæum, and in the anal furrow.

Trunk and Extremities.—On these regions, yellow, red, macular, slightly scaly lesions occur, or they are nummular and covered with thick, fatty crusts, reposing on a dry, glistening, or a moist base. Beyond the crusts, a narrow red zone is usually seen. These lesions may fuse together and form patches of variable size. In the umbilicus, the symptoms described under seborrhœa sicca of that locality are found.

On the palms and soles, the scaling is only moderate in slight cases, and the patch is ill-defined; but in the severer examples, there is sharp definition and the scaliness is marked. The exudation may be retained here, owing to the thickness of the epidermis, and vesicular and bullous formations occur, which, on rupturing, expose weeping surfaces, which may become crusting. Between the fingers, the same symptoms as are found in the inguinal regions will be seen. In certain cases, in which the disease has existed on some portion of the body for a long time, a dystrophic condition of the nails may also be observed. Whether it is due, however, to the same cause or not, it is difficult to say.

There are certain examples of the disease, which are claimed by Unna to be erroneously included in psoriasis. They consist of those which begin upon the scalp, and appear upon the favorite sites for his seborrhoic

eczema, leaving the elbows and knees free. The lesions are papular in character, round or oval, or nummular disks, or circinate, gyrate, or polycyclic bands. They are bright or yellow-red, sharply defined, and often show a wrinkled condition of the epidermis along their peripheries. Sometimes slightly scaly, they may also be crusting, the crusts being fatty, and covering a dry, glistening, or moist base. When the lesions form circinate, gyrate, or other shaped lesions, I have always found the portion upon which involution had occurred yellowish and covered with small fatty scales, in contradistinction to the almost normal appearance of the skin under the same conditions in psoriasis.

The disease occurs most frequently in a disseminate manner, but occasionally it may become more or less diffuse, and even universal. There is then a most distinct fatty, rancid odor exhaled from the surface.

Dermatitis seborrhoica may exist alone, or in conjunction with any form of disease. Sometimes it may be engrafted upon the lesions of some other process, and an efflorescence of mixed character is the result. I have very frequently seen the seborrhoic dermatitis coexisting with an acne, a sycosis, and various other diseases. Rosacea is often complicated by it, and not infrequently directly produced by its presence on the nose and the neighboring portions of the cheeks.

It is frequently found either coexisting with or complicating syphilis. Unna claims that the latter is the case when the papular lesions of syphilis are of a fresh yellow-red color, and are scaly or crusting; also when serpiginous extending rings with yellow centers exist, or when there is exudation and a sensation of itching, heat, and tension. Syphilides located over the sternal and interscapular regions, on the scalp, and along the margin of the hair, in the axilla, on the pubes, etc., are also usually complicated by the seborrhoic dermatitis. I do not think, however, that the complication must be regarded as invariable under the conditions mentioned, but only as possible. The same localities may certainly be affected, and the same variety of lesion may be present, without there being any reason to premise seborrhoic dermatitis.

It may thus be seen that dermatitis seborrhoica includes various cutaneous conditions, phenomena and forms of lesions, which are described separately in our text-books, and are regarded either as distinct processes, or as parts of other diseases. In 1891 (*New York Medical Journal*), I asserted my belief in the propriety of Unna's claims in regard to these phases of disease, basing my opinion upon a study of two hundred and thirty-two cases; and I can now only repeat the earlier statements which I made, having since then seen their corroboration furnished not by a few, but by an enormous number of cases.

Etiology.—No age seems to be exempt from seborrhoic dermatitis, and I have met it in infants a few weeks old, and in adults up to eighty

and ninety years of age. The period between ten and thirty seems to be, however, especially liable to its development. Both sexes are subject to the disease, but women appear to be more frequently affected. The majority of the patients enjoy good functional and general health, but constipation, gastric and intestinal and menstrual disorders may be present, as well as anæmia, tuberculosis, syphilis, and many other general diseases. Still, the existence or removal of any of these systemic conditions is not followed by any manifest change in the cutaneous process. Local conditions, however, certainly favor its development on the scalp, and among these, there may be mentioned faulty or entire want of care, either from habitual neglect or from the inattention due to a long or protracted illness, which kept the patient in bed.

Irritating and other injurious applications also appear to predispose to it, and want of personal cleanliness and of bathing, the nonuse of soap and water, the wearing of flannel, may all be regarded as etiological factors. It is for this reason, that the disease is frequently seen on those who perspire freely, and in those localities where the sweat is apt to be retained and soften and macerate the epidermis—in the axilla, under the hanging breasts, in the inguinal regions, etc. The influence of the seasons of the year is of some importance, but not, I believe, *per se*, but owing to conditions superinduced by them. Cases thus originate much more frequently in winter, or the cold season, than in the warm months; but in the former, we find that, among the majority of people, good ventilation, open-air life, bathing, etc., is at a minimum, while in the summer months, these factors are at their maximum. I may add, furthermore, as evidence of the value of these factors—which exist in the cold season—the fact that almost all my cases developed on those who led an indoor life, and very few upon those whose occupation, etc., kept them constantly in the open air.

There is likewise a probability that contagion is an important etiological factor. The many cases which have come under my observation, in which the origin of the disease could be traced directly to a barber, to a hairdresser, to the use of brushes, etc., of an individual with the disease, and the spreading of the affection from one member of a family to others, would all appear to suggest that the process under certain conditions may be to some extent contagious.

Heat and moisture may also be considered as factors of importance, as far as every portion of the body is concerned. But on the scalp, their influence has been frequently demonstrated to me among those who wear their hats constantly, who work with the scalp exposed to heat, and, in women, who mass their hair over the crown of the head, etc.

Morbid Anatomy.—In the slighter grades of seborrhoic dermatitis—those represented by *pityriasis capitis* and *alopecia pityrodes*—I found

in the corium a slight inflammatory infiltration about the papillary vessels and the ascending branches from the subpapillary plexus and along the



FIG. 22.—From a case of pityriasis capitis.

hair-follicle (Fig. 22). In *seborrhœa sicca*, the infiltration extended to the plexus itself; while in the higher grades, when redness, crusting, or moisture were clinically present, the inflammation had attacked more or less of the entire cutis, which was in addition slightly œdematous (Figs. 23 and 24).

In the rete, in the slighter grades, the changes consisted of a few vacuolelike formations in the basic layer, and a few wandering cells. In the higher grades, all stages in the formation of these vacuoles could be traced, and it was seen that they were primarily the product of a nuclear degeneration resulting in complete destruction of the nucleus (Jour. of Cutan. and Genito-Urin. Dis., 1893, Elliot). In addition, areas of cells undergoing

destruction and scarcely staining were present, and numerous wandering cells. The stratum granulosum was considerably increased in places, but only slightly so in the lesser grades of the disease. Mitosen were more or less abundant. The horny layer, in the earlier stages of the process, was somewhat thickened, loosely coherent, and separating off easily between the orifices of the follicles. About and in the follicular openings it was hyperplastic, filling and choking them up, the hair-follicle dilated and sometimes funnel-shaped; while the horny epidermis was wrapped and twisted around the projecting hair-shaft (Fig. 22). In the higher grades, there appeared to be incomplete hornification, the basic layer of the stratum corneum was much thickened, the cellular elements were of various shapes, not flattened, and contained nuclei staining well. Here and there, small cavities could be seen lying between the layers of the horny stratum, or between it and the rete, which contained small, darkly staining round cells and granular *débris*, representing undoubtedly vesicular formations not objectively apparent.

The sebaceous glands were apparently unchanged, and in preparations made with osmic acid, they were stained a uniform black, and there was no evidence of any incomplete metamorphosis of their cells such as would be expected if the phases of disease examined were *dry seborrhœa*. In proportion to the grade of the process, this black stain was found to vary in amount in the opening of the hair-follicle. In the slightest grades, when the hyperplasia of the epidermis was not excessive, it was noted between the horny masses loosely filling up the follicular duct, and also to some extent permeating the external epidermis. When, however, the horny plug was dense and the follicle dilated, only a narrow black line was seen, and the external surface was scarcely changed. But when in the higher grades, the rapid production and incomplete keratinization of the horny epidermis was noted, or when there was a seborrhœa oleosa and the production of soft fatty crusts, the entire follicular opening, the external horny layer, and a portion of the rete were of a black color. The sweat or coiled glands were never found by me to contain any fat, either in their coils or ducts. In many instances, however, there was a degenerative process found in the entire or in portions of a coil. The affected portions were dilated and swollen, the cubical layer of cells cast off and lying loosely in the lumen, apparently imbedded in a mass of granular matter. Cells in all stages of degeneration were present, and mitosen were found here and there.

Unna reported as a characteristic feature of the disease, the presence of fatty infiltration in the corium and throughout the entire rete. I have never been able to find evidences of such infiltration in the cutis nor in the rete, except in a few instances, and then in its upper portion contiguous to the horny layer.

Pathology.—In view of the manifest evidences of inflammation of the cutis in all stages of the process, we are, in my opinion, justified in regarding it as an inflammatory disease—a dermatitis—which, owing to

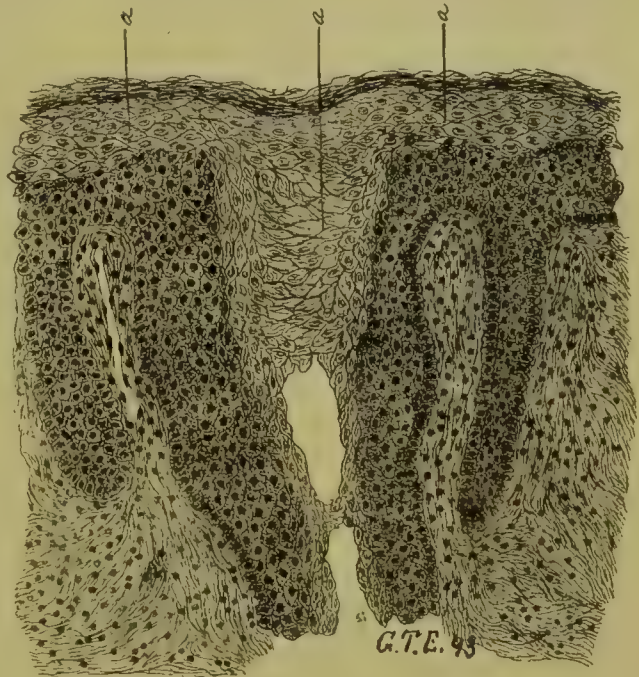


FIG. 23.—Section through a hair follicle on scalp from a patch clinically corresponding to seborrhœa sicca. *a*, basic layer of stratum corneum. In cutis inflammatory infiltration.

the exudative changes accompanying all its lesions, is of catarrhal nature. Unna claimed that it was a parasitic disease, and recently has stated that he has found in the tissues a mulberry coccus constantly present. On the scalp, he says, it is accompanied by Malassez's flask-shaped bacillus, which exist in the scales in great abundance, but he attributes to them only a secondary rôle. Inoculation experiments with the mulberry coccus produced typical eczema vesicles, and on rabbits, redness with subsequent alopecia. Inoculation of pure cultures of Malassez's bacillus was without effect. Unna's investigations have not as yet been corroborated, but

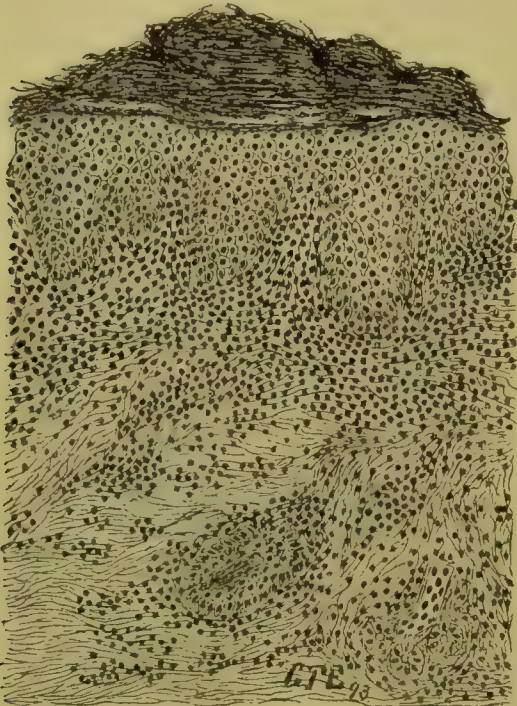


FIG. 24.—A small papule of seborrhœa corporis. In the cutis dense inflammatory infiltration.

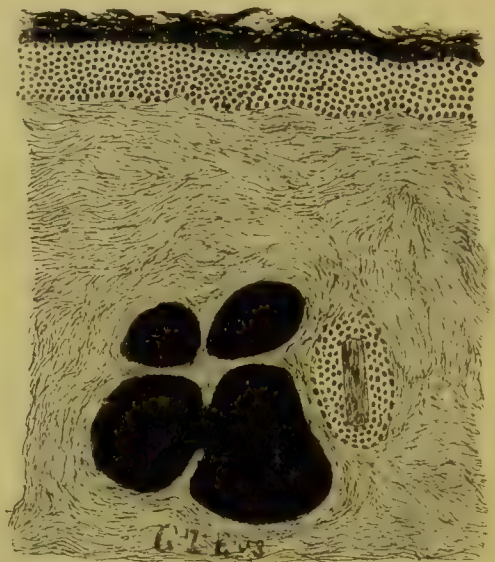


FIG. 25.—Section obliquely cut showing sebaceous gland filled with fat, and stratum corneum also in part blackened; osmic acid preparation from a case of seborrhœa sicca capitis.

there are so many clinical and other grounds which support them that it is probably only a question of time before the process will become generally recognized as parasitic in nature.

The claim that a fatty hypersecretion is an integral part of the disease and that it is derived from the sudoriparous glands, I am unable to corroborate. It seems to me preferable to regard this fatty symptom so frequently present as a secondary one, manifested under certain conditions of location and grade of the process, and as derived from the sebaceous glands. I have never been able to find any evidences in the coiled glands themselves or in their ducts, which would warrant the claim that they were the source of the fatty hypersecretion.

Diagnosis.—The diagnosis of seborrhoic dermatitis will be made upon the evidences of its inception upon the scalp, and its gradual extension downward from that surface to affect especially the various localities

previously specified. At the same time, the superficial seat of its lesions, their sharp delineation and tendency to peripheral extension and evolution into circinate, crescentic, and other forms, their peculiar yellowish or yellow-red color, the presence of the fatty element, and the slight degree of subjective disturbance accompanying their presence—all these furnish a picture sufficiently characteristic for easy recognition.

From *pityriasis maculata et circinata*, it may be differentiated by observing that the former does not follow the mode of extension of dermatitis seborrhoica, but is limited almost altogether to the trunk, sometimes appearing upon the extremities, but not upon the scalp. It has, moreover, no favorite localization, its lesions are not sharply defined at their peripheries, but are diffuse; they regularly enlarge to form rings, the centers of which are, however, dry and fawn-colored, having a seared appearance instead of being covered with thin, yellow, greasy scales and crusts, as are met with in similar lesions of the seborrhoic dermatitis. Besides, the pityriasis runs a rapid course of six weeks or two months, rarely longer, while the dermatitis seborrhoica may last for years.

From eczema originating from various causes, its differentiation is important. From that form which is reflex in origin and seen especially in babies, it may be distinguished by the fact that the eczema is always symmetrical, occurs upon both cheeks especially, leaving the middle portion of the face free, and when it appears elsewhere, it is usually upon the extensor surfaces of the extremities, particularly about the elbows, wrists, knees and ankles, and only rarely does it develop upon the trunk. The lesions consist of more or less circumscribed, round or irregular shaped patches, formed by the aggregation together of papules and vesicles upon a reddened, somewhat swollen base. There are usually marked weeping and intense itching, and the character of the symptoms changes constantly in accordance with the infant's general functional and systemic condition.

When an eczema from external irritation exists, or one due to the combined action of some systemic disturbance and an external irritation, the patches or areas affected are differently delineated, and present vesicles, pustules, or papules, with the formation of exudation crusts, and extensive weeping may also occur. No definite localization is followed, but the disease occurs on any portion of the body.

There are, besides these, other clinical forms of eczema occurring especially on varicose legs and on the hands, intertriginous eczema and intertrigos of irritative and other origin which might be considered here, but the clinical characteristics of the seborrhoic inflammation have been sufficiently delineated to render its recognition a facile one, and further mention is unnecessary.

Unquestionably, it is often extremely difficult to decide whether a

case that presents itself is a psoriasis or a psoriastiform eruption. Usually, the dermatitis seborrhoica avoids the localizations for psoriasis, but yet the lesions presented may be most typically those of the latter disease. More often, however, they are of a fresh yellow-red; the scales, instead of being white and silvery, are greasy, and tend to form crusts; and when circinate or other shaped lesions develop, the skin upon which involution has already occurred is yellowish, greasy, and scaly. Punctate hæmorrhage may be obtained by scratching the lesions of both; so that it is often more particularly from the mode of origin, localization, course, and mode of behavior of the eruption than from the lesions themselves that the diagnosis can be made.

Prognosis.—As far as cure of the disease is concerned, the prognosis is favorable, but relapses are frequent, and an individual who has once had an attack of dermatitis seborrhoica appears liable to renewed development of the process. I believe that these relapses are usually the result of contagion, of a new infection; but Unna states that, in his opinion, the parasitic element may remain latent in the coiled glands, and thence, under proper conditions, reinstitute the train of pathological symptoms. The prognosis in regard to the alopecia, which so frequently results from the process, is also favorable, but the result will depend upon the acuteness or chronicity, the period of duration of the loss of hair, and the care with which the treatment is carried out.

Treatment.—I have never found that the presence or the removal of any internal systemic disturbance influenced the lesions of a dermatitis seborrhoica, and consequently can not advise any particular general and internal treatment. Unna has stated, however, that in some cases the long-continued administration of arsenic has been beneficial. On general principles, it may be recommended that all deviations of health and of hygienic laws should receive appropriate attention and medication. The local treatment is of paramount necessity. We may lay down as a rule that cure of the scalp is of prime importance, whether it alone is attacked or some other portion of the body at the same time. There are two drugs which exert especial effect upon the disease—viz., resorcin and sulphur. Rarely is recourse to any others necessary, though occasionally in persistent patches of the scalp or nonhairy parts, chrysarobin, pyrogallol, gallanol, or some one of the other stronger reducing agents are indicated, and even necessary. The mercurials I have found to be of little benefit, while salicylic, boric, and tannic acids are only of occasional use, or only in some cases, when the skin reacts antagonistically to resorcin or sulphur. On the surfaces covered with hair, lotions are more useful than ointments, and one containing resorcin (three to ten per cent), in equal parts of alcohol and water, can be particularly recommended. A strength of from three to five per cent is generally sufficient, but in some instances,

ten, fifteen, or twenty per cent will be found necessary. The scalp or other affected surface should be thoroughly moistened by the lotion two or three times daily. A small sponge or a hand atomizer may be used, or it may be done with the hand. Washing with soap and warm water should be ordered once or twice a week. Any good soap may be used, but I have seen much benefit from a resorcin superfatted soap, or a resorcin, sulphur, and salicylic-acid soap. Should the lotion prove too drying, or produce tension and irritation, a resorcin ointment (three to five per cent) may be applied once or twice a week, or alternately with the lotion.

When the attack is a very acute one, and there is considerable inflammation both of the scalp and face, weaker percentages are advisable, and ointments are preferable. It is in these cases that salicylic acid (two per cent) or boric acid at first does a certain amount of good, and subsequently the resorcin. Usually this line of treatment is sufficient to remove the disease, but not infrequently some degree of it remains, or reappears as soon as the application of the resorcin is stopped, and in these cases sulphur is particularly to be recommended. The ointment of the United States Pharmacopœia, or a stronger or weaker application may be used. The sublimated has always appeared to me to be more efficacious than the precipitated sulphur. On smooth surfaces of the body, the resorcin is preferable in ointment form, three to ten per cent, though admirable effects are obtained when it is combined with my Bassorin paste. The resorcin, or resorcin and sulphur soap is also of benefit if softened with water and used as a salve. When the type of the disease is similar to that of a psoriasis, then chrysarobin, or pyrogallol in collodium or in liquor gutta percha, or in ointment form, is indicated. When the process is so located that it may be called an intertrigo, a one to two per cent ointment of resorcin is usually strong enough, and the affected surfaces should also be separated by pledgets of absorbent cotton. The mild applications are indicated particularly when infants are subjects of the disease, and when more or less extensive areas are affected, owing to the risk of absorption and the production of carbolic urine, a result I have experienced in my own practice.

When the auditory canal is attacked, syringing with warm water and the use of a spray of resorcin (one per cent) in benzoinol can be recommended. The best results obtained when the vermilion border of the lip was affected has been from resorcin in Bassorin paste. Besides the remedies mentioned, there are others which may be enumerated as of benefit in special cases, or under certain conditions, such as carbolic acid, the ungt. hydrarg. nitratis, or ungt. hydrarg. ammon., 3 jv; bismuth, 3 j; ungt. zinci oxidi, 3 jv. M. et sig. In some instances, when there is some thickening, the tars are useful—pix liquida, ol. cadini, rusci, etc.—but they are rarely called for.

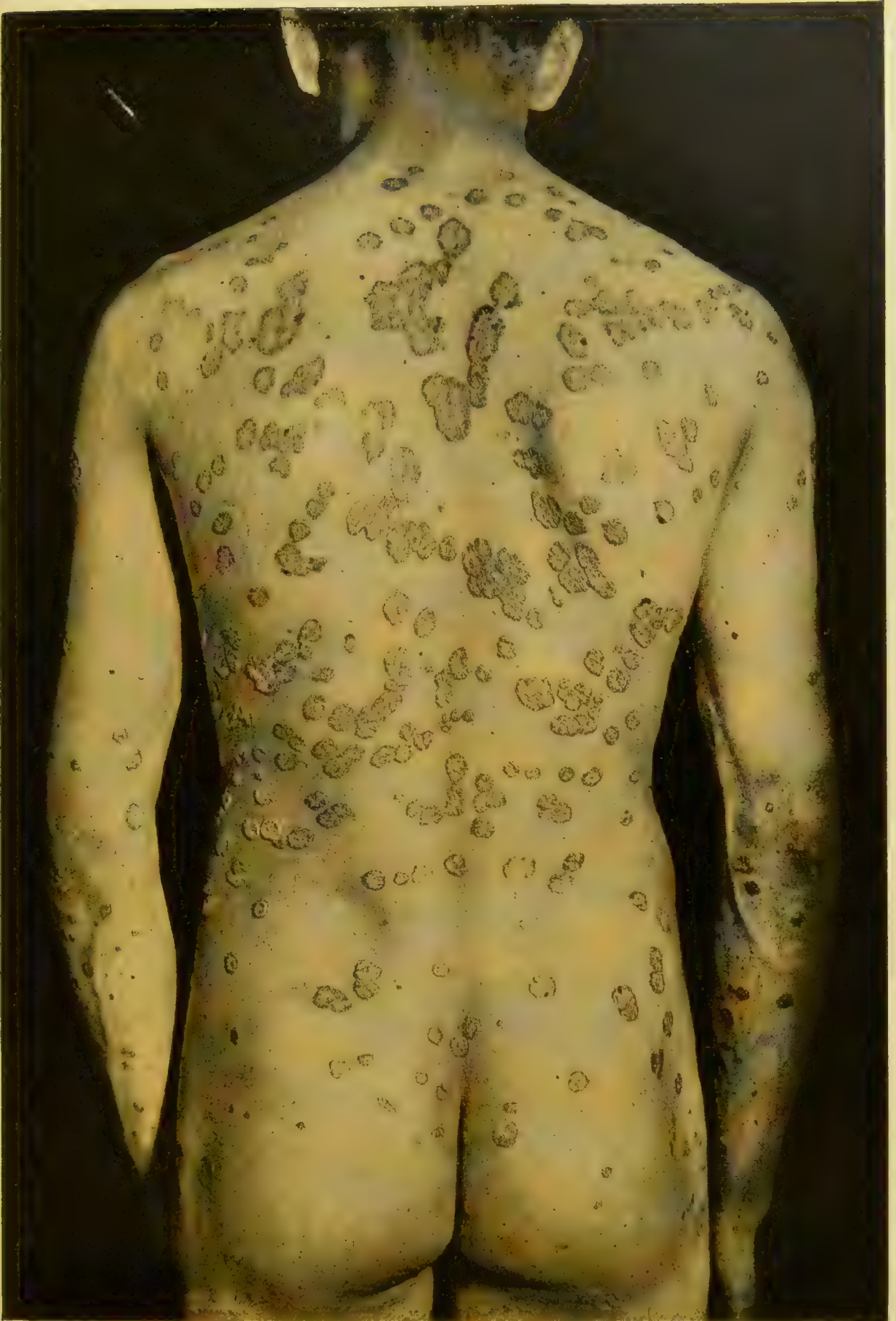
PSORIASIS. (WILLIAM THOMAS CORLETT.)

Derivative: *ψωρίασις*, an itchy disease.

This term was applied by the Greek and Roman medical writers to a variety of cutaneous disturbances which are now recognized as differing both in nature and origin. To Robert Willan (*On Cutaneous Diseases*, London, 1798) we are indebted for extricating psoriasis from this heterogeneous group, and describing it as a disease *sui generis*. During the present century the eleven varieties described by this writer have been reduced to a unity, and are now regarded as different stages of the same disease.

Symptomatology.—Psoriasis is, then, a disease of the skin, with an eruption which varies in distribution as well as in the size and shape of its lesions. These are characterized by the formation of a thick, adherent, imbricated covering of dry scales of a light yellow, pearly-white or silvery color, situated on a reddish, slightly elevated, well-defined base. Psoriasis appears without premonitory symptoms, and the first indication of its presence is the appearance of small, pinhead-sized, rose-colored spots, which in a day or two become covered with silvery epidermic scales—**psoriasis punctata**. These spots increase at the periphery, while the scales become piled up into thick crusts, which, from their resemblance to drops of mortar spattered on the skin, constituted Willan's **psoriasis guttata**. If the attack runs an acute course, the patches rapidly increase in size, and in a week may attain the dimensions of coins—**psoriasis nummularis**. Generally, however, the eruption is noted for its chronicity, and months are required for this development. The tendency of the psoriatic lesions is to disappear of their own accord, although the time occupied in this process may be months or years. The activity of the scaly proliferation first begins to subside in the center of the patch, which finally goes on to complete resolution, leaving a ring-shaped margin standing out in bold relief—**psoriasis annularis**. If the disease continues to extend, the rings meet, giving a figure-of-eight-shaped eruption, and as the healing proceeds, the point of contiguity in turn disappears, leaving irregular or serpentine lines—**psoriasis gyrata**. Again, in both the acute and chronic forms, large surfaces become implicated, until, in severe cases, the eruption covers the whole body like a glistening coat of mail—**psoriasis diffusa**. As new spots appear from time to time, and as there is no regularity in the evolution of the individual spots, a given case may present a wide range both as to size and shape of its lesions.

The accumulation of scales, which is the most distinctive feature of psoriasis, varies in different cases, as well as on different parts of the body of the same individual. On the scalp the scales are thick and the erup-



PSORIASIS (Piffard).

tion is prone to extend beyond the margin of the hair. On the extensor surfaces of the limbs, also, the scales become piled up on an elevated base to the height of several lines. On the face and penis the scales are less abundant. Although the scales are adherent to each other and to the base underneath, yet they may be detached by the finger nail, when, if the disease is of recent origin, a pale, reddish surface, which readily bleeds, and is but slightly raised above the surrounding skin, will be seen. In cases of long standing, the base is of a darker or venous hue, and markedly thicker than the normal skin. The scales thus removed are quickly renewed, and in a few days attain their former thickness. There is no discharge nor moisture connected with the eruption at any time, and the sensation of itching may or may not be present. It is a disease of all climates, all races and conditions of men, and is seen from infancy to old age.* Psoriasis is further characterized by its tendency to return, and once established it usually reappears at various intervals during an entire lifetime. In the order of frequency of all diseases of the skin, according to the report of the American Dermatological Association for 1891, it comes fourth. In Scotland, Anderson (*Dis. of the Skin*, 1887) places it next in frequency to eczema and scabies, while in France, Hardy (*Traité des Maladies de la Peau*, Paris, 1886) assigns it a position second to eczema. It is not a common disease in the negro (Morrison, *Trans. of the Am. Dermatological Assoc.*, 1885), and in temperate climates it is better in summer than in winter.

The disease usually appears for the first time early in life, and, according to Greenough (*Trans. Am. Dermatological Assoc.*, 1885), most frequently between the ages of ten and fifteen years. It varies in severity in different individuals, as well as in the same individual during different attacks. Although all parts of the body may be involved, yet there are regions of predilection which are generally involved, especially at the onset of the disease. These are the points of the elbows and the anterior aspect of the legs just below the patellæ. The scalp is also a favorite position, and in typical cases the disease is more marked on the extensor than on the soft, flexor surfaces of the body. In all cases the eruption tends to a symmetrical distribution. Psoriasis rarely appears on the palms of the hands and the soles of the feet, and never on these parts alone.† It never invades the mucous membranes (Hebra, *On Diseases of the Skin*, vol. ii, London, 1868), but may extend over the glans penis, as

* Willson's youngest case was three months, and his oldest eighty-five years (*Lectures on Dermatology*, London, 1873-'76). Kaposi's youngest case was thirteen months (*Lehrbuch der Hautkrankheiten*, Wien, 1873, p. 259). Elliot reported a case of thirteen months (*Medical Record*, July, 1886).

† Neumann cites a case in which the palms alone were affected, but two years later the disease appeared on the elbows and knees (*Hautkrankheiten*, Wien, 1876, p. 286).

in a case now under observation; nor does it interfere with the growth of the hair. The nails, on the contrary, may be secondarily implicated, in which case they may remain in a diseased condition long after all other evidences of psoriasis have subsided. The disease usually attacks the nails of one or two fingers, which may be the only ones involved, or after resolution other fingers may be implicated, but seldom all at the same time. The nail is dry and brittle, breaks off before it reaches the end of the matrix, is greatly thickened, and of a brown, muddy color. Certain conditions supervening during the course of psoriasis have the power of modifying the eruption. Thus it is commonly observed in acute febrile affections that the lesions disappear until the patient has regained his accustomed health, when they return. On the contrary, parturition and lactation have an unfavorable effect on the disease, and in some instances it shows itself only at these times (Anderson, *Dis. of the Skin*, Philadelphia, 1887, p. 332). Syphilis has no influence on psoriasis, and the two eruptions appear unmodified side by side. Eczema may occur with psoriasis and the eruptions likewise remain distinct throughout. In young, strumous subjects, according to Liveing (*Diagnosis of Skin Dis.*, London, 1878), psoriasis assumes its most typical appearance. The eruption in this condition is further described by Bulkley (*Clinical Study and Analysis of One Thousand Cases of Psoriasis*, Cong. Internat. de Dermat. et de Syphilig., Paris, 1889) as being more indolent, less irritable, and having a greater accumulation of yellow scales, which are thicker and more adherent. Again, the underlying conditions of gout, which frequently supervene as age advances, modify the eruption (the author, *Dis. of the Skin in the Subjects of Gout*, Jour. Cut. and Ven. Dis., 1886, p. 265).

Here the itching, which is always more marked, is sometimes intense; there is a thinner covering of scales, which are less adherent, giving to the eruption the appearance of circumscribed plaques of squamous eczema. The base in this condition extends beyond the scaly covering, and is of a brighter or brick-dust redness.

Pathology and Morbid Anatomy.—Some difference of opinion exists among histologists as to the rôle the various structures of the skin play in psoriasis, as well as the part first involved. There are those with Gustav Simon (*Allgem. med. Zeit.*, 1870), Wertheim (*cit.* Neumann, *Hautkrankh.*, Wien, 1876, p. 292), and Neuman (*loc. cit.*, p. 291), who maintain that the process is primarily a congestion of the capillaries in the papillary layer of the cutis, which is followed by cellular extravasation and consequent enlargement of the papillæ. This, it is claimed, gives rise to an increased activity in the lowermost cells of the mucous layer of the epidermis which corresponds histologically to a chronic inflammation of the skin. More recently, Robinson (*Man. of Dermat.*, New York,

PLATE IV.



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PSORIASIS of the PALM (Elliot).

1885, p. 388) and Jamieson (The Histology of Psoriasis, Edinburgh, 1885) have found the first pathological changes in the stratum mucosum, with hyperplasia and a rapid increase in number of cells of this layer. The same phenomenon was observed in the external root sheath of the hair-follicle, which in structure corresponds to the mucous layer of the epidermis.

As the process continued there was great thickening of the mucous stratum, most marked in the interpapillary spaces, which extended downward into the derma, giving to the papillæ the appearance of elongation. The changes which take place in the derma, according to these observers, are secondary, and consist of an enlargement of the blood-vessels of the papillary layer, with serous exudation and the presence of small round cells in the adjoining tissue. Pecirka (Zur Histologie des Psoriasis, Monatsh. prak. Dermat., 1887, No. 2) also observed these changes, and found grains of keratohyalin in the stratum mucosum. He found the stratum lucidum but little altered, as was the stratum granulosum. The latter was composed of from one to two layers of cells. Micro-organisms were found only in the superficial part of the stratum corneum. Loewe (Zur Anatomie der Psoriasis, Mittheilungen aus der dermat. Klinik des Charité Krankenh. zu Berlin, 1887) found the stratum lucidum mainly involved; while Auspitz teaches that psoriasis is essentially a disease of the corneous layer, a chemical anomaly, or a condition of abnormal keratization.* There is little doubt that the primary pathological changes, so far as we are able to observe, take place in the epidermis, and are first manifested in the stratum mucosum as an hyperplasia, with an increase of the cell elements of this layer. It is not an inflammatory disease, therefore, and the changes seen in the derma are secondary to those observed in the epidermis. Further, the cells of the corneous layer are changed, which may be due to an anomalous keratization, or may be dependent on the hyperplasia and imperfect cell formation in the rete. Following this there is an engorgement of the arterioles of the papillary layer, with transudation of serum and the presence of small cells in the tissue around the vessels. Finally, a venous congestion is observed in the deeper parts of the derma, best seen in cases of long standing. With these subsequent changes in the derma, the base of the psoriatic patch becomes thickened and elevated above the normal skin.

Etiology.—Since the humoral pathology of our forefathers fails to meet the more exacting requirements of our time, the cause of psoriasis remains a *bête noir* in dermatology. The relics of this theory, however, still present themselves in the form of the various diatheses; and recently Bourdillon (Psoriasis et Arthropathies, Paris, 1888), of France, has collected data associating psoriasis with the so-called arthritic diathesis. In

this country, Bulkley (Congrès Internat. de Dermat. et de Syphilig., Paris, 1889, p. 891) is a strong advocate of the arthritic condition as an etiological factor in psoriasis. But Charcot (Gaz. des Hôpitaux, 1889, p. 1007) and others have further ascribed this arthritic condition of the joints to a disturbance in the posterior columns of the cord. Lang (Viertelj. für Dermat. u. Syph., 1878) first discovered micro-organisms in the psoriatic scales, and Eklund (Arch. de Dermat., 1883, No. 4) reproduced them from cultures, which observations were confirmed by Wolff (Internat. Med. Cong., Copenhagen, 1884). On the contrary, M. Quinquaud (De la Flore Cutanée, Annales de Dermat., 1889, p. 352) found similar micro-organisms in the superficial layer of all scaly affections of the skin. He therefore concludes that there is no parasite special to psoriasis. Hauner (Deutsch. med. Zeit., September 20, 1886) found only the microphytes of Bizzozero, which are present on the normal skin. Attempts at inoculation have failed. That psoriasis is due to a perversion of the nervous influence in the skin is not a new idea. M. Rendu (Ann. de Dermat., 1874, No. 6, and 1875, Nos. 1, 2, 3) demonstrated that in large plaques of psoriasis both tactile and thermic sensibility of the skin were lessened, while the sense of pain remained unimpaired. In certain circinate forms of the eruption he found analgesia.

Leloir (Leç. Nouv. sur les Affect. Cut. d'Origine Nerv. Ann. de Dermat., 1887, p. 374) cites cases in which violent emotions induced an outbreak of psoriasis in those predisposed. Hebra (*loc. cit.*, vol. ii, p. 10) gave neuralgic complaints, especially sciatica and pricking sensations in the ends of the fingers and toes, as frequent complications of psoriasis. So far the evidence favors the theory of Weyl (Handbook of Skin Dis., Ziemssen, 1885), and others, that psoriasis is due to a functional weakness of the nervous center regulating the nutrition of the skin. With this condition present, the distribution of the eruption may depend on local irritation, such as the rubbing bands of skirts, suspenders, the pressure of hats, and its frequent occurrence on the elbows and knees. Psoriasis is more common in men than in women, and frequently a history of the disease in some other member of the family may be obtained.

Diagnosis.—Although psoriasis is usually a well-defined disease and easily recognized, yet it is subject to great variations, and in atypical cases may baffle the skilled diagnostician. In appearance it varies from a simple furfuraceous desquamation, which may be the result of friction, to a veritable inflammation, as in squamous eczema. Eczema squamosum, however, is less frequently symmetrical; the flexor surfaces of joints are favorite positions, while the extensor, or points of the elbows and knees, are not affected, as in psoriasis. In psoriasis the eruption is sharply defined, and its margins frequently stand out like a bold headland; while in eczema the patch is thickest in the center, and its margins merge

gradually into the healthy skin. A history of moisture will often enable one to decide; for eczema at its outset is always moist, while psoriasis is essentially a dry eruption from the beginning. In eczema the accumulation of scales is less than in psoriasis, and they are of a brownish color, rather than silvery-white. The scales in eczema are more easily detached, and the base when scratched becomes bathed with a serous exudation, and does not bleed, as in psoriasis. Eczema of the palms and soles is more common than psoriasis in these positions; it is more fissured, and may be the only part involved, while psoriasis does not attack these parts alone. The nails are affected in both diseases, but in eczema they are usually all affected at once; while in psoriasis one or more, never all, are involved at the same time.

Seborrhœa of the scalp often bears a close resemblance to psoriasis. In the latter the eruption is present on other regions of the body, or, upon inquiry, there will be found a history of the disease on parts, such as the extensor aspect of the legs and arms, where seborrhœa does not come. In psoriasis the eruption extends beyond the margin of the hair, while seborrhœa does not. The scales in seborrhœa are dark yellow or brownish, and have an oily consistency when rubbed between the thumb and finger. Seborrhœa does not heal in the center; therefore it is never, as in psoriasis, ring-shaped. The base of seborrhœa is often pale, and never raised above the surrounding skin.

Lupus erythematosus bears some resemblance to psoriasis in a mild form, but lupus usually appears after thirty, psoriasis before thirty. Lupus most frequently attacks the face, and the lesions are few in number, while psoriasis seldom attacks the face, and never this part alone. On the scalp lupus destroys the hair, while the hair is unaffected in psoriasis. The scales in lupus are fewer, more adherent, and, when removed, small spinous processes will be found extending into the sebaceous follicles of the skin. Finally, lupus leaves slight scars, whereas the skin in psoriasis returns to its normal consistency.

Tricophytosis is another disease that must be borne in mind in making a diagnosis; but in this a history of contagion may usually be obtained, the eruption is less scaly, the hairs are always affected, becoming brittle and broken off near the surface of the skin. When in doubt, the microscope will reveal the spores and mycelia of the trichophyton, which are absent in the scales of psoriasis.

Pityriasis rubra attacks the whole surface of the body; it is a grave disease, and accompanied with more prostration than is psoriasis. The epidermis is not piled up, but comes off in large flakes and in abundance, leaving the skin a bright red. There is no thickening of the skin, as in psoriasis.

Lichen planus et rubra may be mistaken for psoriasis when the former

is of long duration. Lichen first appears in the form of small, pinhead to split-pea sized, flat-topped papules, which are distributed in clusters, and, extending at the periphery, run together, giving the eruption the appearance of one continuous patch not unlike psoriasis. But there is less scaling in lichen, and the eruption extends by the formation of the characteristic islets which may be seen on the outskirts of the original cluster. The characteristic position of lichen is on the flexor aspect of the wrists—a position seldom occupied in psoriasis.

Ichthyosis is a congenital disease, appearing a few months after birth, and remaining with little or no variation during an entire lifetime; while psoriasis usually appears for the first time later in life, and is subject to long periods of quiescence. Ichthyosis usually occupies the entire surface of the body. If certain regions only are involved, it manifests no tendency to extend, which is quite unlike psoriasis. Ichthyosis is an anomaly of keratinisation, without subsequent perceptible engorgement of the derma, while the base of the psoriatic patch is distinctly hyperæmic. The scales of ichthyosis are dark brown, never silvery-white.

Syphiloderma squamosum often resembles psoriasis very closely, and next to eczema is most liable to be mistaken for this disease. On account of the close similarity, this form of syphiloderma was formerly called syphilitic psoriasis. But syphilis attacks the mucous surfaces as readily as the skin, and is seldom present on the latter without appearing on the former; while psoriasis never attacks the mucous membranes. Syphilis but rarely occurs on the elbows and knees, but it is very commonly met with on the palms of the hands and soles of the feet. One hand may be affected in psoriasis, while both are usually involved in syphilis. The eruption in syphilis is polymorphous, presenting from time to time papules, pustules, and moist condylomata, which would at once enable one to distinguish it from psoriasis. In late syphilis the destructive nature of the disease will become apparent by scars or fissures on the tongue or at the angles of the mouth, while psoriasis leaves no mark behind. The scales in syphilis are muddy-gray, and the base of the eruption is more infiltrated and of a darker color. Moreover, the history of the disease should always be considered.

Prognosis.—Psoriasis never, so far as I am aware, affects the health of the individual, although White (Trans. of the Am. Dermat. Assoc., 1885) and H. von Hebra (Monatsh. für Prakt. Dermat., No. I, 1887) mention verrucous growths degenerating into epitheliomata, as a sequel they have observed. Neither does the disappearance of the eruption affect the internal organs. In the main, then, the prognosis of psoriasis as to life is favorable; but as to the eruption itself, much depends on the severity of the disease, the age at which it first appeared, and the length of time the eruption has remained before instituting successful treatment.

When taken at the outset and during the first attack, it disappears more readily; subsequent invasions are less severe, and if these in turn be summarily dealt with the disease may finally disappear. In severe or neglected cases, however, it returns in spite of our efforts to the contrary, and it may continue unto old age.

Treatment.—This consists, first, in the ingestion of drugs and other substances whose object is to improve the nutrition and regulate the functions of the various organs of the body, rather than to act in a direct or specific manner on the disease itself. The second is by topical applications acting directly on the diseased structure.

Constitutional Treatment.—In all cases the first thing to do is to place the patient on a proper hygienic basis. The diet should be regulated to suit the age and bodily condition. In childhood, indigestible articles of food should be withheld, tea and coffee should be replaced by milk and cream, and in most cases a generous though plain diet should be recommended. In adult life, alcoholic drinks should be prohibited, as well as strong condiments and the excessive use of tobacco, and a vegetable rather than an animal diet encouraged. Passavant, of Frankfort, recommends an exclusive meat diet in psoriasis (*Archiv der Heilkunde*, p. 251, 1867). In old people less food is required than in youth, and it should be plain and easily digested. In the feeble, moderate stimulation is advisable, and claret, sauterne, or sometimes burgundy, may be taken once or twice a day at mealtime, while meats should be partaken of sparingly; moderate exercise in the open air; change of scenery, with cessation of mental worry or excessive bodily fatigue. The second consideration should be the general condition of the patient independent of the eruption. In youth, if anæmia, enlarged glands, or a state of debility exists, cod-liver oil, iodine, iron, and the vegetable bitters should be given. Later, when the indication for these is past, arsenic in its various forms, either alone or combined with one of the preceding, will best maintain the body in its normal tone, and thereby assist external means in dispelling the eruption. Arsenic, which has stood so long without a rival in the treatment of diseases of the skin in general, and which has enjoyed the distinction of being considered a specific for the scaly diseases of which psoriasis is a type, must at last yield the palm and return to the common level of other drugs, which benefit only when judiciously employed. It is in early life, and after the acute stage has subsided, that the greatest good is obtained from arsenic in the treatment of psoriasis. The preparation used is of less importance than are the indications for giving it. The arsenite of potassium, as in Fowler's solution, is one of the best forms of giving arsenious acid. It is advisable to begin with a small dose, and gradually increase it as its toleration becomes better established. Thus, for a child ten years old one drop may be given in water or milk

either during or after meals, three times a day. In a few days, if no contra-indications arise, this may be increased one drop after the evening meal, then one after breakfast, until six drops a day are given. Some tolerate arsenic remarkably well, and ten drops per diem are given before the eruption yields or the physiological effects of the drug are produced. Children stand proportionately larger doses than adults, yet I have never found it necessary, nor can it be recommended, to resort to larger doses. Fournier (*Trait. du Psor.*, *Gaz. des Hôpit.*, July 18, 1889) begins with a maximum dose, and gradually lessens the quantity. He also advises that it be discontinued from time to time, that complete toleration be not established, which renders it inert as a curative agent. Further, that it should not be given at the outset of the disease, nor in inveterate cases. Jonathan Hutchinson recommends alternating, at periods of a few weeks, the arsenite of potassium with the arseniate of sodium, Pearson's solution. The bromide of arsenic, which was suggested to me several years ago by Dr. Z. T. Dellenbaugh, has proved of service in the treatment of psoriasis, and may be given in larger doses, if well diluted, than the arsenious acid (for detailed account, see author's article in *N. Y. Med. Record*, April 14, 1885).

Arsenic has also been given subcutaneously, and Lipp (*Arch. für Dermat.*, 1869), who first employed it for psoriasis, reports favorable results. Anderson (*Dis. of the Skin*, 1887) also recommends it in obstinate cases. He uses the liquor sodæ arseniatis, ten minims daily, increased to twenty minims if necessary. Care must always be taken in giving arsenic that toxic symptoms do not supervene, such as conjunctivitis, œdema of the lids, gastric disturbances, dryness of the mouth, and *malaise*. In middle life a different line of treatment is usually called for. Functional derangements due to excessive strain on the vital powers, excessive eating, drinking, worry, and too close application to business, dyspepsia and the evils that follow in its train, may each and all aggravate the disease. Here the line of duty varies with the case, and the therapeutical measures are selected on general principles without the least regard to the cutaneous disturbance. In general, however, tonics are indicated, and sometimes the bicarbonate of soda. In those addicted to alcohol the carbonate of ammonia is highly spoken of by Anderson. In malarious districts quinine is valuable in restoring the bodily vigor, while an efficient and convenient combination may be made of—

R	Acidi arsenici	.	.	.	.	.	.	.	gr. $\frac{1}{10}$ — $\frac{1}{15}$
	Ferri redacti	.	.	.	.	.	.	.	gr. j
	Strychniæ sulph.	.	.	.	.	.	.	.	gr. $\frac{1}{60}$

M. Ft. pil. no. j.

Sig.: One to be taken either before or after meals, according to the quantity of arsenious acid.

As old age approaches, psoriasis may become associated with organic diseases—gout and arthritic affections of the joints. In old age, too, the skin has long since taken on the psoriatic habit; its treatment, therefore, is never followed with brilliant results. The effect of arsenic, which in the young is usually perceptible and sometimes followed by marked improvement, now ceases to give relief. If the gouty state exists, colchicum will benefit the patient and prepare the way for local means; for in the gouty state the skin easily inflames, and does not well tolerate strong local applications. Again, much depends on the condition of the eruption itself. When it runs an acute course, especially if accompanied by much irritation and redness of the skin—a condition previously alluded to as occurring in the subjects of gout—or when there is a tendency to the deposit of lithates in the urine, the alkaline diuretics, as recommended by the late Tilbury Fox, and colchicum, are given with benefit. The liquor potassæ, in doses of from ten to fifteen minims, is also of service in this condition.

Haslund (*Gazette des Hôpitaux*, 1889, p. 745), of Copenhagen, has advised the iodide of potassium in large doses for the treatment of psoriasis. Of fifty cases, his reports show forty cured. The ordinary dose that he recommends is from three to four grammes a day, which may be increased to fifty grammes during the four-and-twenty hours, should the case require it. In this country, iodide of potassium has not met with favor in the treatment of psoriasis. According to Hardy (*Traité des Maladies de la Peau*, Paris, 1886), the drug next in usefulness to arsenic is tincture of cantharides. Balsam of copaiba, also recommended by Hardy, is well spoken of by Anderson. Chrysarobin a few years ago was recommended by Bulkley, Robinson, and Piffard, but this, in common with others, has passed into disuse. Quite recently Bramwell (*Brit. Med. Jour.*, October 28, 1893), has recommended the internal administration of the thyroid gland of the sheep in the treatment of psoriasis. Of the cases subjected to this treatment Bramwell reports three in whom the eruption disappeared in from six to eight weeks, while in one no improvement was observed. Abraham (*Lancet*, January 13, 1894), in summarizing the results in the seventeen cases reported up to that time, says but seven were benefited, and in some instances the eruption was aggravated by the thyroid extract. From the foregoing it will appear that the ingestion of the thyroid gland has some influence in modifying the nutrition of the skin, but further observation is required to establish the claims made for it in the treatment of psoriasis. The fresh gland may be finely minced, one fourth of which is concealed in a wafer and taken daily. An extract is also made of which from five to ten drops is the daily quota. Tabloids, five grains, containing one eighth of a gland are also prepared, the dose being three per diem. In brief, then, there is no specific for

psoriasis; each case presents a clinical study in itself, which may or may not call for constitutional treatment.

Local Treatment.—This is now generally acknowledged to be of the highest importance in the management of psoriasis, if not the only curative means at our command. The first step to be taken is to remove the scales. For this, warm alkaline baths, followed by brisk rubbing with a flesh brush, will usually suffice. This is especially applicable in acute cases, or when the skin is irritable or easily inflames. When the scaly accumulation is of long standing, hard, and firmly adherent to a dark base, it may be necessary to supplement even a prolonged bath by the application of the tincture of green soap. It was a custom of the late Prof. Hebra to apply soap vigorously rubbed into the base of the patch with a stiff brush, followed by an ointment; but in this country it can be used only when the eruption is of very limited extent. Once the scales are removed, it is essential to a successful treatment that they are not permitted to reaccumulate. For this purpose it is necessary to repeat the bath every day or two until they cease to form. Instead of warm baths, Anderson (*Dis. of the Skin*, 1887) speaks well of the cold pack, as first devised by Priessnitz, in which the patient is placed in bed on a water-proof sheet and carefully wrapped in a wet cloth, covered with blankets, and given large draughts of hot water to encourage free perspiration. He is allowed to remain in this position three or four hours, twice a day. This is followed by a cold bath and rubbing with a coarse towel. In addition to this, the French employ a rubber dressing, taking different parts until the entire surface of the eruption has been operated upon. But not all persons affected with psoriasis have either the time or the means of resorting to this procedure. They can apply an ointment, however, and the one recommended by Jamieson serves the purpose well. It is composed as follows:

R Ammonia carbonatis	. . . . .	3 ij
Lanonlini	. . . . .	3 iv
Cerati galeni	. . . . .	ad 3 j. M.

Sig.: Apply three times a day, followed by a warm bath at night.

A very convenient and efficient application for this purpose is composed of a ten-per-cent solution of salicylic acid in flexible collodion or traumaticin; this is painted over the scaly patch and allowed to remain twenty-four hours, when a warm bath will loosen the edges so that the varnish may be removed with the finger nail. After the disintegrated scales are washed off the varnish should be reapplied, until the scales are entirely removed. In most cases a Turkish bath, repeated once a week, will accomplish this more agreeably than by any other means. Having attained the first object in the local management of the disease, the next

step is to select a suitable application. In this, one must consider the age of the patient, the extent and location of the eruption, whether it is acute or chronic, the texture of the skin itself, and whether or not it tends to inflame. In mild cases, or if taken at the beginning of the first attack, the foregoing treatment will frequently be all that is required. When the skin is very irritable and readily inflames, mild applications should be continued until the disease subsides or stronger preparations can be borne.

Tar is the oldest of all topical remedies in the treatment of psoriasis, and to-day is favorably known and extensively used. The ordinary *pix liquida* is liable to excite an inflammation if allowed to come in contact with the surrounding skin, and when used over a large surface may cause toxic disturbances, giving to the urine an olive tint and a tarry odor. This form of tar, then, is applicable only to limited areas, and in cases of long standing that have resisted milder applications; it should be thoroughly rubbed into the patch twice a day. Oil of cade is a more convenient form of tar, and is used quite extensively in the Hôpital St. Louis, Paris. It may be employed either alone or with glycerole of starch in the proportion of one part of the oil of cade to five parts of the glycerole of starch. In place of the latter the oil of sweet almonds makes an agreeable vehicle. These applications are made every night, and the underclothing, which becomes saturated with the oil, is worn during the entire course of treatment. If the patient is able to follow the treatment only during the night, he is directed to take a warm bath every morning, a bland ointment is applied, he dons clean undergarments, and follows his vocation. Less disagreeable than these is the oil of white birch (*oleum rusci*), employed in tanning Russian leather, which is used in the same way as the other forms of tar.

But these substances have several objections which militate against their use. These are: the disagreeable odor, which necessitates the patient's isolation during treatment. In young people or those with delicate skins, in acute attacks or when the skin is congested and irritable, tarry preparations often increase the congestion and aggravate the disease. Others, again, have an idiosyncrasy against tar, so that the smallest quantity is not tolerated. There is an alcoholic preparation of tar, known in England as the *liquor carbonis detergens*, which has many advantages over the other forms of tar previously mentioned, and which I am in the habit of using in the treatment of psoriasis (*R* *Liquor carbonis detergens*, 3j; *acidi salicylici*, gr. iij; *hydrarg. ammon.*, gr. x; *lanolini*, 3ij; *ungt. simplicis*, adde 3j. *M.*) It finds its most useful field on the face, scalp, and other exposed parts, as it is of a more pleasing odor and does not stain the skin. Mercury is also used in the treatment of psoriasis, and when the disease is in a mild form, as on the face, it is frequently of service. The oleate and the white precipitate are the forms principally

used. Pyrogallic acid, first introduced by Jarisch, is a valuable remedy, but, on account of the danger of absorption, is applicable only when the eruption covers a small area and is used only when the disease is intractable. In the two fatal cases of pyrogallic-acid poisoning reported by Vidal and Neisser (*Gaz. des Hôpit.*, 1889, p. 759), the toxic symptoms supervened rapidly—general *malaise*, vertigo, nausea, diarrhœa, dark or reddish urine—followed by dyspnœa and death. The usual strength is from five to ten per cent, made into an ointment, or, what is preferable, a solution in flexible collodion or traumaticin.

Chrysophanic acid, or later chrysarobin, was added to the armamentarium of the dermatologist at the instigation of Balmanno Squire, of London, who first used it in Europe, although in the form of goa powder it had been previously used in Brazil for the treatment of trichophytosis and other cutaneous affections. Chrysarobin is an active irritant, and sets up an acute dermatitis when it comes in contact with the normal skin, consequently care must be taken in applying it to extensive surfaces. On this account, too, it is to be withheld in acute attacks, from the eyelids and the delicate skin of children. Usually, however, when psoriasis presents itself for treatment these contraindications have long since past, and it stands to-day the most valuable of all drugs in the management of this protean malady. It has, further, the disagreeable property of staining the skin and underclothing an indelible reddish-brown. It is used in the form of an ointment, in the strength of from ten to thirty grains to the ounce of vaseline or lard, which should be thoroughly rubbed into the psoriatic patch lest it spread to the normal skin. To obviate its unpleasant features, it is better to apply it held in suspension either in flexible collodion or traumaticin.

Fox, of New York, has advised the addition of salicylic acid to the above, in the proportion of ten parts each of the chrysarobin and salicylic acid, fifteen of ether, and flexible collodion to one hundred parts. As soon as the varnish begins to peel at the margins it should be removed, the scales, if present, detached by thorough washing, and the varnish reapplied.

Haumer prefers a ten-per-cent solution in chloroform, which should be applied with a stiff brush and thoroughly rubbed on to the psoriatic patch. To complete the cure after using chrysarobin, Hardaway advises sulphur ointment.

PITYRIASIS MACULATA ET CIRCINATA.

(WILLIAM THOMAS CORLETT.)

Synonyms: Pityriasis Rosea; Herpes Tonsurans Maculosus.

This affection was first described by Gibert (Traité Prat. des Mal. de la Peau, Paris, 1860), under the title of *pityriasis rosé*, which name is still retained in France, where the disease has been most generally recognized. Later, Bazin (Les Affect. Génériques de la Peau, Paris, 1862, p. 331) more clearly described the same affection, and pointed out certain variations in appearance, which he designated *pityriasis maculata* and *pityriasis circinata* respectively. In this country, Duhring (Am. Jour. Med. Sci., 1880, p. 359), unaware of the descriptions previously given and the recognition the disease had already received in France, reported ten cases which, as he afterward ascertained, corresponded in the main to those detailed by Gibert, Bazin, Hardy (Leçons sur les Affect. Cut. Dart., 1868), Horand (Ann. de Dermat. et de Syph., 1875-'76, vol. vii, No. 5), and Vidal (Leçons de Vidal, 1877). In Germany and Austria it is not regarded by all dermatologists as a distinct affection. In England it has received but little attention, and is frequently confounded with other cutaneous maladies of a similar appearance. Trustworthy statistics are, therefore, not at our disposal as to the frequency of the disease in the countries mentioned.

The reports of the American Dermatological Association show that between 1878 and 1887 inclusive there were seventy-one cases of pityriasis maculata et circinata out of 123,746 of all cases reported, or .057 per cent. During the three years following—viz., 1889, 1890, and 1891—there were 38,001 cutaneous diseases reported, of which eighty were pityriasis maculata et circinata, showing the disease to be well recognized in this country, and not of very infrequent occurrence.

Symptomatology.—Pityriasis maculata et circinata is an erythematous-squamous affection, characterized by the appearance of sometimes bright, sometimes faded rose-colored spots, or maculæ, varying in size, of a round or oval shape, but slightly elevated above the surrounding skin, and covered with a thin, adherent layer of furfuraceous or branny scales. The disease generally appears without premonitory symptoms, although at times there may be constipation, a slight fever, a feeling of *malaise*, and loss of appetite, either preceding the attack, or, more rarely, only during the height of the eruption. According to Brocq (Ann. de Dermat. et de Syph., 2d series, vol. viii, p. 615), the eruption is preceded by a single, reddish macule, which he terms the primitive lesion. The patient may be unaware of its presence until it has attained the size of a half dollar or larger. There is at times moderate itching, notably

when the patient perspires or is placed in a high temperature. From ten to fifteen days usually elapse before the eruption proper appears. This may be limited to one or two maculæ, or the disease may assume a confluent form, and involve nearly the whole surface of the body. Most commonly, however, the eruption is limited to the trunk, especially the supra- and infraclavicular regions; less frequently it spreads to the arms and thighs; while it seldom extends to the face, scalp, hands, or feet. At first the maculæ are small—not larger than a split pea—of a dull rose-red color, sometimes bright at the margins, which partially disappears on pressure, and extend at the periphery until they attain the dimensions varying from a dime to a silver dollar. In the cases reported by Duhring (*loc. cit.*) the eruption was more extensive, and in one covered the entire trunk, buttocks, groins, genitals, thighs, and legs, and the arms and forearms. Over the trunk and thighs the eruption presented a diffuse, almost continuous sheet. This is unusual, and occurs only in severe outbreaks of the disease. After a few days the center of the macule begins to fade, until it assumes a *café au lait* or dusky-yellowish tinge, with a rose-red, slightly elevated margin. With the fading of the roseate blush the macule becomes covered with a thin, adherent layer of light, fawn-colored, or whitish, branny scales. Sometimes the center of the patch goes on to complete involution, leaving only the ringed border, which constitutes the circinate variety of Bazin. Again the lesions assume an oval outline, with the long axis transversely to the long axis of the part upon which they are situated; or, in extending, two spots may coalesce, forming a peanut or figure-of-eight-shaped lesion. In most cases the subjective symptoms are but slight. The eruption is symmetrical, is dry throughout its entire course, and disappears of its own accord in from three to eight weeks; rarely does it persist for as many months, and the lesions fade away in the order in which they came, leaving light brownish or yellowish discolorations, which gradually disappear, resembling in its course and termination the exanthemata.

Pathology and Morbid Anatomy.—So far as our present knowledge extends, the process consists primarily of a slight hyperæmia in the papillary layer of the derma, leading to exudation and desquamation; during its entire course it is confined to the superficial layers of the skin. It does not affect the hair. The disease has repeatedly been subjected to microscopical examination, probably because of its striking resemblance to *tinea circinata*. Vidal (*Annal. Dermat. et de Syph.*, 2d series, vol. iii, p. 338) described a parasite which he called *microsporon anomæon vel dispar*, believing it to be special to *pityriasis rosé*, but his observations have not been confirmed by other investigators. More recently, Jacquet (*Annal. Dermat. et de Syph.*, 2d series, vol. x, p. 22) has given the morbid processes of *pityriasis maculata et circinata* the most careful investigation. He

PLATE V.



Coloritype Co.

PITYRIASIS MACULATA et CIRCINATA (Chatelain).

failed to find the microsporon anomæon, or any micro-organism not found in normal epidermis.

Etiology.—Failing to establish a relationship between the micro-organisms and this affection, various other theories have been advanced as a possible cause. High temperature, excessive perspiration, and the irritation of undershirts, especially unwashed flannel, have been assigned as causes of this disease. Feulard (*Annal. de Dermat. et de Syph.*, 2d series, vol. x, p. 459) has observed dilatation of the stomach a frequent accompaniment, and Duhring observed digestive disturbances in many of his cases. But the cause of pityriasis maculata et circinata still remains unknown.

Diagnosis.—There can be no doubt that many cases of pityriasis maculata et circinata pass without recognition; in fact, the disease often-times gives so little disturbance that a physician is not consulted. In Germany and Austria it is confounded with *tinea circinata* (*herpes circinatus*), to which it bears so close a resemblance. But, in the first place, pityriasis is not contagious, while trichophytosis is highly so, and frequently spreads through schools and other institutions where children are congregated. Again, pityriasis does not extend to the scalp, and but rarely is it seen on the face, and the hairs remain normal, which is quite the reverse in trichophytosis. Pityriasis disappears in a few weeks, even without treatment, while trichophytosis lasts for months and years, being extremely rebellious to treatment. *Tinea circinata* is most frequently seen in children; pityriasis may occur in middle life. Finally, the trichophyton may be detected readily in *tinea circinata*, but never in pityriasis maculata et circinata.

Syphilis, during its early stages, may also be readily mistaken for pityriasis maculata et circinata, especially when the latter extends over large areas. But the color in syphilis is darker, the lesions are more widely distributed, and are especially prone to appear on the upper part of the forehead and palms of the hands, where pityriasis does not come. Other evidences of syphilis, too, are seldom absent for any length of time, such as falling of the hair, mucous patches, and the enlargement of the superficial lymphatic glands. Syphilis is seldom acquired before maturity, while pityriasis may be seen in children.

Seborrhœa, especially the variety described by Unna as *eczema seborrhoicum*, may very readily be mistaken for pityriasis. But the color, which is so distinctive in pityriasis, in seborrhœa is of an ill-defined, muddy-yellow cast. The scales are oily and loosely attached in seborrhœa, dry and firmly adherent in pityriasis. When rubbed or scratched, seborrhœa becomes moist and easily bleeds, while pityriasis is dry, and scratching only roughens the surface.

Eczema squamosum may assume quite the appearance of pityriasis;

but in the former there is more itching, there is always a history of moisture, and the eruption does not follow the central involution and ringed appearance of pityriasis. When denuded of scales, eczema has moisture oozing from its base, which is not so in pityriasis.

Psoriasis, in a very mild form, or at its onset, bears a slight resemblance to pityriasis. But psoriasis is more scaly, the scales are whiter, and the outlines of the lesions are better defined. Again, the position of the eruption, and its slow involution in psoriasis, will usually enable one to distinguish the two affections. The history of former attacks in psoriasis will also serve as a useful guide.

Tinea versicolor might possibly be mistaken for pityriasis rosea. But the absence of the characteristic rose-colored hue, which gives name to the latter affection, as described by Gibert, together with the dark-yellow color of the former, would of themselves afford sufficient evidence to make a diagnosis in most cases. If doubt still exists, the microscope will reveal the *microsporon furfur* in tinea versicolor, while, as previously stated, no special micro-organism has yet been found in pityriasis.

Prognosis.—This is unexceptionally favorable; the disease is self-limited, and runs its course in a few weeks, usually from four to eight; rarely does it continue for as many months.

Treatment.—In a disease so mild and self-limited as pityriasis rosea there is usually little need of medication other than meeting any special indication that may arise. Gastric disturbances, constipation, etc., are frequently present, and appropriate means should be taken to correct the same. For this the diet should be restricted to easily digestible articles of food; saline cathartics are often called for, and in severe cases, with slight fever, diuretics may be advisable. Locally, the mildest applications are usually sufficient, such as the alkaline or starch baths, and, if necessary, a five-per-cent solution of resorcin to relieve the itching. If the eruption persists, stronger applications are to be recommended, and the glycerole of tannin, diluted with an equal part of distilled hamamelis, will hasten resolution. Ichthyol, or naphthol, from five to fifteen grains to an ounce of lanolin or vaseline, may be used with benefit, and the sulphur ointment (U. S. P.) is highly spoken of.

DERMATITIS EXFOLIATIVA. (WILLIAM THOMAS CORLETT.)

Synonym: Fr., Pityriasis Rubra Aigu.

The term *dermatitis exfoliativa* was first given by the late Sir Erasmus Wilson (Lectures on Dermatology, London, 1871-'73) to a rare disease of the skin, which had been previously described by Gibert (Manual des Mal. Speciales de la Peau, Paris, 1834) and Devergie (Traité Prat.

des Mal. de la Peau, Paris, 1857) as *pityriasis rubra*, a name employed by Bateman (Pract. Synopsis of Cutan. Dis., London, 1814) to designate a scaly, reddened condition of the skin. But, from the indefinite description of this author, we are in doubt as to whether the eruption referred to belonged to a distinct type, as did that of Gibert and Devergie, or to stages or anomalies of well-known diseases, such as eczema, psoriasis, etc. Bazin (Leçons Theor. sur les Affect. Cut. de Nature Arthritique et Dartreuse, 1868) had also observed the disease described by Wilson, which he called *herpétide exfoliatrice*, as a sequel to other dermatoses; he further drew attention to its frequent fatal termination. Alibert's (Traité des Maladies de la Peau, 1825) *dartre furfuracée volante* and Rayer's (Traité Theor. et Prat. des Mal. de la Peau, 1835) *pityriasis généralisé* probably also referred to the same condition. In 1862, Ferdinand Hebra (Hautkrankheiten, I. Aufl., 1862) described an extremely rare affection of the skin, to which he attributed such striking features that it has since borne the name of *pityriasis rubra* of this observer. It is a noteworthy fact, also, that since the time of Hebra the pityriasis rubra of Gibert and Devergie, so accurately described by these authors in 1834 and 1857 respectively, and the dermatitis exfoliativa of Wilson, have not been recognized in Germany; while in England the disease described by Hebra as one hitherto unknown is regarded as identical with the affection as portrayed by these authors.

Thus, on account of the multiplicity of terms and the rarity of the affections themselves, there is much confusion in the medical literature of to-day concerning these exfoliating inflammations of the skin.

Although we regard the dermatitis exfoliativa of Wilson, which includes the affections described by Alibert, Rayer, Devergie, and Bazin, and the pityriasis rubra of Hebra as closely allied, if the latter be not a more grave form of the same morbid state, yet it presents certain distinctive features which call for a separate consideration.

Definition.—By dermatitis exfoliativa, therefore, we understand a subacute or chronic inflammatory disease of the skin, which may be primary, or supervene as a secondary manifestation to certain other cutaneous disturbances of long standing, characterized by a more or less profound hyperæmia of the whole or greater part of the integument, the copious and repeated exfoliation of variously sized scales, and finally the atrophy of the cutaneous appendages and the more or less complete shedding of the hair and nails.

Symptomatology.—When the disease begins as a primary affection its advent is sometimes marked by a distinct chill, sometimes a general feeling of *malaise*, anorexia, with nausea and vomiting, and in the skin itself formication is not an uncommon symptom. Or the eruption may be the first indication of the disease, which appears quite suddenly, fre-

quently in the form of diffused erythematous surfaces, resembling erysipelas. Again, it may come in the form of papular spots, scaly patches, or bullæ; but as it is seldom seen by the medical attendant during this stage, our knowledge must be drawn largely from the statements of the patient. From the first the eruption is sensitive to cold, and rubbing of the clothing is a source of annoyance. With this there is usually a tingling sensation, and sometimes moderate itching. The eruption may appear on one or several parts of the body at the same time. According to Leloir and Vidal (*Traité Descrip. des Mal. de la Peau*, liv. second, 1890), the favorite positions are the inguinal regions, the inner side of the thighs, the axilla, and in the folds of the joints. Of the twenty-one cases reported by Mackenzie (*Brit. Jour. of Derm.*, 1889, p. 285), six began on the legs and one only on the trunk. In whatever manner the disease begins, or whether one or more parts are primarily involved, it soon assumes its characteristic appearance; the redness rapidly extends, new foci appear, and in a few days the whole integument becomes more or less deeply hyperæmic, slightly thickened, and sometimes firm and tendinous. There is usually a slight rise of temperature in the more acute form of the disease, and at the beginning an evening temperature of 101° or 102° Fahr. is not infrequent.

Crocker (*Diseases of the Skin*, 1893) has observed an evening temperature of 104°. Only exceptionally is the pyrexia continuous. The color of the skin varies from a bright red to a deep violaceous hue; the latter is most marked on the back, the inner aspect of the thighs, and on dependent parts, such as the legs and scrotum. From one to two weeks after its invasion the skin assumes a deeper tint, becomes lusterless, and the epidermis shrivels up into variously sized flakes or scales. These are adherent in the center, or at one margin only, and are readily detached, filling the clothing or covering the sheets with a copious collection of light-brown scales, which resemble shreds of crumpled tissue paper. The scales vary in size on different parts of the body and in individual cases. They are largest on the back, where they measure from a half to three quarters of an inch in breadth and from one to two inches in length. They are smallest on the face, where they appear like a fine, branny desquamation. On the scalp the hair becomes inextricably matted with sebum and epidermis. When fully developed the patient presents a striking appearance. It has been likened to plate armor, fluffiness of the skin, and to an exfoliating coat of whitewash. It may be observed, also, that the arrangement of the scales is peculiar, in that they often follow the natural movement or cleavage lines of the skin; hence they appear ribbed or in striæ. The exfoliation is always the most conspicuous feature, and is always very abundant. Wilson, in his vivid description of the disease, estimates that fully a pint is cast off in twenty-four hours;

PLATE VI.



Coloritype Co.

DERMATITIS EXFOLIATIVA (Robinson).

while Devergie states that from one to two quarts were shed in the same space of time. When the flakes are removed the underlying skin appears smooth and shiny; but it does not so remain, for within a few hours new scales form, which in turn are shed, and so on to the end of the disease. The last parts to be affected are the hands and feet, especially the palmar and plantar surfaces, which sometimes escape. In these latter positions the epidermis comes off in large plaques, and not infrequently the entire cuticle of the hand may be drawn off like a glove. Finally, the appendages of the skin are involved, the hair becomes brittle, loses its gloss, and falls, producing baldness more or less complete. In like manner the nails succumb, grow opaque or dark brown, sometimes are raised from the nail-bed by accumulating epithelium underneath, or are otherwise deformed, so that they resemble claws more than appendages to the human skin. They are easily broken, become fissured, and not infrequently are cast off *en masse*. During the height of the disease, also sometimes at the beginning, rarely throughout its entire course, there may be a slight exudation, especially noticeable where two surfaces of skin come in contact, as in the axillæ, the sides of the chest, the inner surface of the thighs, and under the breasts in women. This may be in the form of an ichorous discharge, or there may be vesicles or blebs, although moisture plays quite a secondary part in the history of the disease.

This process may go on for months or years with variable severity, exacerbations alternating with short periods of improvement, apparent recoveries followed by relapses. In the meantime the general health, which during the first few months seemed unimpaired, becomes more and more prone to various disturbances. The obstinate constipation, which is usually present at first, gives way to diarrhœa, or the two conditions alternate. The appetite becomes capricious, and renal complications are sometimes encountered. The urine is often deficient in urea, but is generally heavily laden with urates. There is a strong tendency to inflammation of the mucous membranes, best observed in parts adjacent to the skin, as in conjunctivitis and stomatitis; although bronchitis and gastritis are frequent accompaniments to the cutaneous disturbance. The superficial lymphatic glands are often enlarged, and sometimes suppurate, while furunculosis, œdema, and extensive decubitus are frequently met with late in the disease, with marked enfeeblement and cachexia. Vidal (*loc. cit.*, p. 154) mentions weakness of the lower extremities amounting almost to paralysis, mental derangements, hebetude, and endocarditis, as frequent complications to the disease. Finally the skin loses its rosy tint and takes on a somber yellowish-brown. The suffering in dermatitis exfoliativa is very variable, and is generally out of proportion to the extent of the cutaneous disturbance. Itching is not usually severe, although it increases as the activity of the disease subsides. Throughout its

entire course the skin remains extremely sensitive to cold, and the slightest draught of air even in a warm room will induce shivering, while at other times the patient complains of a sensation of heat and burning.

The roughness and feeling of constriction are annoying, the latter frequently causing ectropion, while late in the history of the affection the thickening of the derma renders motion difficult, if not painful. The course of the disease is likewise extremely variable, and ranges from a few weeks to as many years. The usual duration may be more nearly approximated at from three to eight months. It is a disease peculiar to adult life, most cases occurring between forty and sixty, and is more common in men than in women.

Dermatitis exfoliativa occurring as a secondary manifestation presents the general characteristics already detailed. Wilson regarded it as a variety of eczema, and Mackenzie (*loc. cit.*) found it most frequently a sequel to that disease; while Crocker (*loc. cit.*) has observed it most commonly after psoriasis. In Bazin's (*loc. cit.*) description of the disease it appears as a late and always fatal complication in other cutaneous diseases of long standing, such as eczema, psoriasis, and pemphigus.

Pathology and Morbid Anatomy.—The disease is essentially an inflammation of the skin. According to Buchanan Baxter (*Brit. Med. Jour.*, 1879, pp. 79–119), at first only the superficial blood-vessels are found dilated, with subsequent enlargement of the papillæ and the presence of embryonic cells and a small amount of serum in the structure of the derma, best seen around the walls of the vessels. Later there is a separation of the corneous layer of the epidermis from the lowermost stratum, and finally an atrophy of the hair-follicles and sebaceous glands. When the disease has existed many years the deeper structures of the derma are found to be involved in the process of cicatrization. Crocker (*loc. cit.*) had the skin examined in a case of two weeks' standing, and found the pathological changes limited to the longitudinal vessels of the superficial plexus of the derma, the papillæ, and the corneous layer of the epidermis. Further, the investigations of Vidal (*Bull. de la Soc. Med. des Hôp. de Paris*, March, 1882) show a complete obliteration of the stratum granulosum and stratum lucidum, the stratum mucosum was slightly thickened, the cell nuclei enlarged, and the cells themselves passing directly, without normal development, to form the exuviæ which give character to the disease. After death the skin resumes almost completely its normal appearance.

Etiology.—The cause of the disease is obscure; many cases begin without previous ill health or disturbance in the skin of any kind. On the other hand, cases have been reported by Dyce Duckworth, Mackenzie, Crocker, and others, with an antecedent history of rheumatism or gout, but no special relationship, aside from the previously mentioned der-

matoses, has been established between dermatitis exfoliativa and any other condition or disease. Cases have been reported in which it was excited by the application of arnica, chrysarobin, and mercury. There are those with Oro (14^e Cong. de l'Assoc. Med. Italienne, a Siennese, Août, 1891. *Comptes rendus, Annal. de Derm. et de Syph.*, vol. iii, No. 3, 1892), of Naples, who regard it a trophoneurosis, and in two autopsies Quinquaud (*Bull. de la Soc. Anatomique*, 1879, p. 604) found lesions in the spinal cord to support this view. Tilbury Fox (*Skin Diseases*, 1887) believed it dependent on a disturbance of the trophic nerves, or in the sympathetic nervous system. On the contrary, Mott, cited by Crocker, found no changes in the spinal cord, pons, or medulla, in two cases subjected to a careful examination.

Diagnosis.—In typical cases and when fully developed there is little likelihood of mistaking dermatitis exfoliativa for any other affection. The disease, however, presents such a wide range as to symptoms, course, and termination, that a diagnosis may not always be readily made. The diseases most liable to be thus confounded are pityriasis rubra of Hebra, erythema scarlatiniforme, eczema rubrum, pemphigus foliaceus, psoriasis, and lichen. For differential diagnosis of the first, see this disease. In eczema rubrum the color is lighter, the eruption merges gradually into the normal skin, it never covers the entire body, and the nails and hair are not cast off as in exfoliative dermatitis. Itching is always an annoying symptom in the former, while it plays an insignificant rôle in the latter. In the history of eczema moisture is always present, while dermatitis exfoliativa is usually dry, and the discharge when present has not the property of stiffening linen, so marked in eczema. Finally, eczema may be successfully treated, while dermatitis exfoliativa is more rebellious, and usually runs an indefinite course regardless of treatment. In many cases it is extremely difficult to differentiate between pemphigus foliaceus and exfoliative dermatitis. This is rendered still more difficult from the fact that in both diseases bullæ may be present as well as moist, excoriated surfaces, with shreds of exfoliating epidermis. But pemphigus is primarily and throughout a moist eruption, the exfoliation is dependent upon an accumulation of serum which forces the epidermis from its natural bed, and the eruption is accompanied by a sickening odor; while exfoliative dermatitis is a dry eruption, which very exceptionally and in certain localities only presents the features above named. Pemphigus, too, is less extensively distributed, and frequently the skin between the lesions remains normal for a long time, while the rapid and universal distribution is almost a constant feature of exfoliative dermatitis. The constitutional symptoms are extremely grave in the former and often entirely absent in the latter. The disease could only be mistaken for psoriasis in exceptional cases, when the latter is very acute and very extensive. But

the true nature of the affection soon becomes apparent by the formation of silvery scales heaped up and firmly adherent, which is quite unlike the disease under consideration. The same is true of lichen ruber and lichen planus. In both, the exfoliation is less copious, the scales are finer, and the lymphatic glands are not enlarged.

Prognosis.—This depends to a great extent on the age and bodily vigor of the patient, and whether the disease begins as exfoliative dermatitis or is consecutive to some other malady. When it begins as a primary affection and before the period of senility, the prognosis is favorable, and the disease is of shorter duration. On the contrary, coming on after the patient is exhausted from a long-standing cutaneous disturbance, especially late in life, the disease is almost invariably fatal. This is most commonly the direct result of pneumonia, pleurisy, marasmus, or exhaustion. In one case I have seen death result from a malignant growth in the left parotid gland.

Treatment.—At the outset it is well to bear in mind that there is no specific for dermatitis exfoliativa. Various drugs have been used, and some have been highly recommended. Especially is this true of arsenic; but in my own experience it is impossible to recall a single instance in which the slightest benefit was derived from its use. Bearing in mind, then, that the main object of internal treatment is to maintain the normal tone, and assist, if necessary, the various bodily functions; and that the mucous membranes are, from the nature of the disease and the relation they bear to the integument, most liable to become involved, the principle of internal treatment becomes clearly established. Foremost, then, comes the selection of a suitable dietary. The simplest articles, of easy digestion, varied to suit the taste of the patient, are to be adhered to throughout. In some cases a milk diet, from two to three quarts per diem, as recommended by Brocq (*Traité des Mal. de la Peau*, Paris, 1892), may be adopted. If diarrhœa is present the milk may be diluted with hot water; generally, however, a more stimulating diet is called for, which will better support the patient and enable him to throw off the disease. If pyrexia is present, quinine should be given; afterward it may be advantageously combined with strychnine and iron. Diuretics are highly recommended by Tilbury Fox (*loc. cit.*), and Stephen Mackenzie (*loc. cit.*) obtained good results by the subcutaneous injection of pilocarpine. Local treatment has for its object the protection of the abraded skin, alleviating the burning and itching, and constringing or allaying the cutaneous hyperæmia. For this the continuous water bath softened by a small quantity of starch is admirable. This, unfortunately, is not practicable except in hospitals where special appliances are provided, and generally recourse must be had to more simple procedures. Mackenzie found the best application to consist of the glycerole of lead and glycerin, of each one ounce, added

to a pint of water. Linen cloths are to be saturated with this, and the whole surface covered from head to foot. About the face and ears soft lint will serve better by being more readily adapted to the uneven surfaces. The patient should remain in bed, with a rubber sheet underneath to prevent the bedclothing from becoming saturated with the lotion. I have found the glycerole of tannin, diluted with from two to six parts of distilled hamamelis, the most soothing application, and one that fulfills all the requirements of a local dressing. When the itching is severe, menthol or carbolic acid, from eight to fifteen grains to the ounce of vaseline or zinc ointment, will afford relief. Whatever local treatment may be employed, warm baths should be taken at frequent intervals. Not only are they agreeable to the patient, but they assist in restoring the normal functions of the skin, and remove the barky and sometimes noxious exfoliation from its surface. Further, the patient should be cautioned against exposure to drafts, and should be confined to a warm, well-ventilated apartment until recovery is complete.

PITYRIASIS RUBRA. (WILLIAM THOMAS CORLETT.)

Derivative: *πίτυρον*, bran.

Symptomatology.—Pityriasis rubra usually begins as a mild departure from the normal condition of the skin, and is insidious in its development. It has been known to appear on the sides of the neck, and on other parts of the body, as an erythematous blush or reddish discoloration. This gives rise to little or no discomfort, and the subjective symptoms, aside from certain neurotic disturbances in the skin—such as chilliness, formication, etc.—are slight. But the eruption gradually spreads, until the trunk, the limbs, and finally the whole body is completely implicated in the diseased process. Thus it may be observed that its obscure invasion, insidious development, and the universality of the eruption, are features of the highest importance in the early history of the disease. In its evolution, too, it is essentially chronic, and months or years may be occupied in attaining its full development. Supervening on the erythema, which is of an intense red color, the surface becomes dry and “scurfy,” branlike scales form, which are rubbed off in the clothing or fall upon the sheets. The exfoliated epidermis is never in large plaques, as in dermatitis exfoliativa, but small and branny; hence the name *πίτυρίασις*. The quantity varies in different cases; it is always abundant, and handfuls may be gathered from the sheets every morning. During the whole course of the disease the skin remains dry, and finally the natural secretions cease. The color, which was bright red at first, gradually assumes a dark-red or cyanotic tint, which is best seen on the

legs. The patient seldom complains of severe itching, but chilliness is a marked symptom throughout. There are no remissions, as in dermatitis exfoliativa, and the course tends slowly but steadily to a fatal termination. According to Kaposi, there may be slight thickening or œdema of the skin at first, although Hebra insisted that the cutis was not infiltrated, "only red and scaly." However, if tumefaction be present it soon disappears, and the skin regains its natural suppleness. After a long though variable time there comes a stage of gradual contraction, the skin takes on a muddy-yellowish hue, or appears almost transparent, is thinner than normal, parchment-like, and the natural movements of the body are interfered with. This is especially noticeable in the eyelids, giving rise to ectropion; the lips are expressionless, and the fingers semiflexed. At this time, too, the hair becomes thinner, and there may be universal alopecia. The nails are thickened, ridged, and friable; sometimes one or more drop off, but these structures are less generally affected than in dermatitis exfoliativa. After months, more frequently after years, the patient grows weak, cachectic, and bedridden. Albuminuria is frequently present, as are granular and hyaline casts. Induration of the superficial lymphatic glands is often observed, which may lead to complete breaking down of the gland structure into a cheesy mass. The appetite, which for the most part has remained unimpaired, now gives way, and the patient dies from phthisis, pneumonia, diarrhœa, marasmus, or exhaustion.

Pathology and Morbid Anatomy.—The skin in pityriasis rubra has been subjected to careful histological examination by various investigators. Hans von Hebra (*Vierteljahrs. für Dermat.*, 1876) found the following changes: Sclerosis of the connective-tissue fibers of the derma and hypertrophy of the yellow elastic filaments; almost a complete obliteration of the papillæ, with atrophy of the interpapillary prolongations of the stratum mucosum, and the deposition of pigment granules in lieu of the Malpighian layer. There was also a disappearance of the sudoriparous and sebaceous glands.

Pétrini (*Comptes rendus Cong. Internat. de Dermat. et de Syph.*, Paris, 1890) found the walls of the blood-vessels in the subpapillary plexus greatly thickened, so that the canal was nearly obliterated. Around the outside of the vessel there was an abundance of elastic tissue. The ducts of the glands were nearly occluded with proliferating epithelium. The follicles of the hair were atrophied, as were the oil glands which surrounded the root. The mucous layer of the epidermis was thickened, containing from eight to ten layers of cells. The corneous layer was irregularly hypertrophied, and showed imperfect keratinisation. In examining other structures of the body Hans von Hebra found in one case tuberculosis of the cerebellum, lungs, and intestines. Jadassohn (*Archiv für Dermat. und Syph.*, 1891, p. 941, and 1892, pp. 85, 271, 462) also

found tuberculosis frequently present in pityriasis rubra. He reports sixteen cases, nine of which were observed until death; of these, seven were examined post-mortem, and, in six, evidences of tuberculosis in various organs were found. Fleischmann (*cit. p.* Weyl in Ziemssen, Handbook of Skin Dis., 1885) reports tuberculosis in the cerebellum of children who had been afflicted with a cutaneous disturbance similar to pityriasis rubra.

Etiology.—When Hebra, more than twenty years ago, first published his observations on pityriasis rubra, nothing was known as to its cause. Since then histological research has accomplished little in this direction, so that to-day we know nothing definitely as to its causation. It is a disease of middle or advanced life, and has been observed for the most part to attack those previously healthy. The morbid condition most frequently associated with the disease is tuberculosis, and from the remarkable frequency shown in Jadassohn's report it would seem that this implies more than a mere coincidence. Yet we are unable to say whether the tuberculosis existed in a mild form prior to the onset of the disease of the skin, or followed as a secondary affection which any debilitated condition might favor. If, as in Hans von Hebra's and Fleischmann's cases, the tubercular process had been located in one particular organ, as the cerebellum, there would be stronger grounds for regarding it as a cause; for with destructive changes in the trophic centers or in the nerves themselves there would be, as a natural sequence, structural changes in the walls of the blood-vessels, as observed by Pétrini, which in turn would give rise to the changes observed in the skin. But, unfortunately for this hypothesis, no such changes have been uniformly observed in the trophic centers; on the contrary, the pulmonary structure and the lymphatic glands have been the favorite positions for this tuberculous development.

Diagnosis.—The only diseases liable to be confounded with pityriasis rubra are exfoliative dermatitis and erythema scarlatiniforme. The points to be observed in differentiating these are, first, relating to pityriasis rubra, its insidious development, branny desquamation, the absolutely dry condition of the skin during its entire course, and, finally, the gradual failure of the bodily powers, cachexia, marasmus, and death; which contrasts with the often benign character and variable course of dermatitis exfoliativa and the evanescent duration of erythema scarlatiniforme, together with the frequent recessions and exacerbations in both.

Prognosis.—As previously stated, the prognosis is unfavorable; yet Kaposi and others believe that patients afflicted with the disease sometimes recover.

Treatment.—This differs but little from that recommended in dermatitis exfoliativa. Supporting measures and tonics are the means most to be relied upon.

EPIDEMIC EXFOLIATIVE DERMATITIS. (WILLIAM THOMAS CORLETT.)

Synonyms: Epidemic Eczema; Epidemic Skin Disease.

Definition.—A disease closely allied to dermatitis exfoliativa, appearing as an hybrid condition between eczema and dermatitis exfoliativa, is one which Dr. Thomas D. Savill defines as a contagious malady in which the main lesion is a dermatitis, sometimes attended by serous exudation, always resulting in desquamation of the cuticle, usually accompanied by a certain amount of constitutional disturbance, and running a more or less definite course of seven or eight weeks (Epidemic Skin Diseases, London, 1892).

Since the summer of 1891, when this affection was first studied in detail in the New Paddington Infirmary, other institutions of the English metropolis have reported similar epidemics* occurring both before and subsequent to the observations of Savill. As the disease has been pronounced by some of the ablest dermatologists of London (Stephen Mackenzie and Mr. Startin, Discussion at Medical Society, November 30, 1891 [Lancet, December 5, 1891], and Mr. Malcolm Morris, Discussion Harveian Society, January 17, 1892) to possess distinctive features, its description seems warranted in this connection.

Symptomatology.—The disease begins without definite prodromic symptoms, except, in some, loss of appetite is observed a few days preceding the eruption. Usually, however, the eruption is the first noticeable indication of the disease, which for convenience of description will be divided into three stages.

Papulo-erythematous Stage.—The eruption begins as an erythema, sometimes diffused, more frequently as a group of blotches or as a single patch. When single, it extends at the periphery and sometimes presents a well-defined, raised border. There is always considerable induration of the skin, and the surface is covered with small, shotty elevations. Œdema is common in parts well supplied with loose cellular tissue. Thus its resemblance to tinea circinata is at times very striking. Again, the erup-

* Mr. Jonathan Hutchinson (Archives of Surgery, January, 1892) reports an epidemic which occurred in the Greenock Parochial Asylum in 1888. Fifty, including the house physician, were attacked, of whom twelve died. Dr. Lees (Lancet, August 22, 1891) reports four cases in St. Mary's Hospital. He adds that rumors of similar cases are reported in the same institution. Mr. Milner reports a case in the Female Lock Hospital which proved fatal (Lancet, September 5, 1891). Dr. Richards reports thirty-eight cases, being three per cent of all inmates of the Hanwell Asylum in the autumn of 1891. A similar epidemic occurred the previous year in the same institution (Lancet, December 5, 1891). Dr. Savill (*loc. cit.*) reports two epidemics which occurred in the Lambeth Infirmary in 1890 and 1891. In the latter there were twenty-five attacked, only one of which proved fatal.

tion is more blotchy, as in r  theln, or more diffused, as in erythema papulatum. This stage lasts from three to eight days, and may be characterized as the stage of the *initial lesion*. Although all parts of the body may be the seat of this primary invasion, yet the arms and forearms are the favorite positions (22.6 per cent), next in frequency being the face and scalp (21.4 per cent).

In most cases the primary patch begins to subside after a few days, and the patient believes himself rid of the complaint, when there is a decided relapse, with the development of new patches. The eruption now assumes a symmetrical distribution and tends to invade the entire surface of the body.

Desquamative Stage.—In two thirds of Savill's cases there was also marked exudation in this stage. Thus, he describes two varieties of the disease—one, which he designates the moist type, seen for the most part in younger subjects; the other, the dry type, which was encountered in old people, and which probably accounts for the more frequent fatal termination of the latter variety. In both types the eruption becomes confluent at the beginning of this stage, of a bright or scarlet color, with subsequently copious and repeated exfoliation of the cuticle in variously sized shreds, which is described as fine and branny or in large plaques. In one of the cases reported by Savill the entire cuticle of the hand was shed *en masse*. The sour, sickening odor, so noticeable in dermatitis exfoliativa, is also present in severe cases of this disease. Underneath the skin is red and swollen.

The constitutional symptoms during this stage depend upon two factors: the extent of the eruption and the inherent vigor of the patient. In all, constitutional symptoms are well marked, the most constant being anorexia and prostration, while great thirst and vomiting are frequently distressing symptoms. The tongue, at first coated, soon follows in the general process of desquamation, when it presents a red, glossy appearance under the loosened shreds of mucous membrane. Diarrh  a is frequently complained of at this time (Savill, *loc. cit.*).* Conjunctivitis is usually an annoying complication when the face is involved. Albuminuria was present in fifty per cent of Savill's cases in the Paddington Infirmary, and seemed dependent on the extent of the cutaneous disturbance. Subjectively, the patient complains of severe burning and itching, worse at night, and the denuded surfaces are painful even to the lightest clothing.

The temperature seldom rises more than one or two degrees; more frequently it falls below the normal limit, especially toward the termination of the exfoliative stage, which latter lasts from three to eight weeks.

* The epidemic at the Hanwell Asylum was followed by an epidemic of diarrh  a without any obvious cause.

Stage of Subsidence.—In severe cases this stage presents extravasations of blood in the derma, increased asthenia, but with a gradual abatement of the exfoliation, although the derma remains for some time red, tense, and indurated. Finally, the skin regains its normal suppleness and assumes a brownish color. During this stage ectropion is common, and the folds of the skin are frequently fissured and painful, while in all cases reported there has been a complete shedding of the hair and nails, which persisted after all traces of the eruption had disappeared. Inflammation of the conjunctivæ is frequently persistent, and even the iris may become involved late in the course of the disease. Convalescence is frequently retarded by furunculosis and carbuncular swellings.

Pathology and Morbid Anatomy.—According to Savill, the disease is essentially a dermatitis, at first presenting engorgement of the vessels with extravasation of leucocytes in the derma. Later, or during the stage of exfoliation, there is found considerable serous effusion, with numerous cells between the derma and epidermis. This latter condition is found even in the dry variety of the disease. Finally, as the eruption begins to subside, a marked excess of fibrous tissue is found in the derma. Microscopical examination of the blood, tissues, and serum has revealed the presence of a micro-organism, an aërobic diplococcus, bearing a close resemblance to the staphylococcus albus, but differing from it in not having the property of liquefying gelatin. This diplococcus both Savill and Russell (Brit. Jour. of Dermat., April, 1892) believe to be special to this affection.

Etiology.—From the standpoint of causation the malady under consideration stands out distinctively from other similar exfoliative diseases of the skin. For the most part the disease has been observed in institutions where a large number of people were congregated, as in infirmaries, workhouses, etc., although a few sporadic cases have been reported.* *Par conséquence*, it has been observed for the most part among the aged and infirm. This, however, is not uniformly the case, as the report of Dr. Savill shows that both himself and a housemaid were attacked, although in a mild form. Neither does it seem to be confined to the human species, as the dog that accompanied Dr. Savill in his rounds through the wards was also affected with a reddened and scurfy condition of the skin, followed by considerable loss of hair. In Klein's laboratory a sub-subculture, originally obtained from an unbroken vesicle of a patient ill with the disease, produced, when inoculated in a rabbit, the following results: During the first five days the animal presented nothing unusual, but on the fifth

* Sporadic cases have been reported by William Cock, Evans, Nias, Gwynn Turner, Harris, Forbes, Turnbull, Caiger, Pringle, Stephen Paget, and Arthur Downes (British Med. Jour., January 9, 1892), and Savill (*loc. cit.*).

day the skin became red and scurfy, which subsided about the eleventh day. During this time the animal manifested no signs of constitutional disturbance, but upon the subsidence of the cutaneous lesions, on the twelfth day, it died without obvious cause. Subsequently, pure cultures of the characteristic diplococcus were obtained from the blood and scurf (Savill, *loc. cit.*).

Again, the disease first manifests itself by an initial lesion, or group of lesions, always conforming to the same general course, remaining a few days without marked constitutional disturbance and then gradually fading away, to be followed by the general attack. In its extension it has been noted that healthy surfaces brought in contact with the eruption are soon invaded; again, the eruption spread by continuity, until in some cases the whole body was involved. It was further noted that the disease traveled from bed to bed in regular order, and especially were those of the inmates attacked who acted as nurses. In this way the disease has been demonstrated to be highly contagious, which feature is unique in this group of dermatoses. Thus, of eight hundred and forty-six patients exposed to the disease between July and November, one hundred and sixty-three, or 19.2 per cent, contracted the disorder. Further, it is a disease of advanced life, and is more common in men than in women. Malcolm Morris (*loc. cit.*) believes it to be a form of contagious eczema. Jonathan Hutchinson (*loc. cit.*) does not regard the affection as remarkable in any way, save in the number of cases met with in one place. This he accounts for by the large number of old and infirm harbored in one building.

Diagnosis.—The diseases most closely resembling epidemic exfoliative dermatitis are exfoliative dermatitis, eczema, tinea circinata, erysipelas, and rōtheln.

Dermatitis Exfoliativa.—Between this disease and epidemic dermatitis the main points of distinction lie in the fact that the latter is contagious, and, as its name implies, appears as an epidemic; while dermatitis exfoliativa is not contagious, and is always a very rare disease. Further, dermatitis exfoliativa is for the most part a subacute or chronic disease, while epidemic dermatitis runs its course in from six to eight weeks. In dermatitis exfoliativa the skin is less œdematous, nor is it accompanied by the same amount of induration which is so marked in epidemic exfoliative dermatitis.

Eczema.—Under this name the disease was first described (Lancet, August 1, 1891), and undoubtedly many cases conform to the general features of this affection. But the constitutional effects of acute eczema are less severe than in epidemic dermatitis, and the definite course of from six to eight weeks is quite unlike eczema.

Eczema, although met with in all ages, is prone to attack young children, whereas epidemic dermatitis has been observed to attack only those

past middle life. The copious exfoliation of the epidermis and shedding of the hair and nails contrast strongly with eczema; while, again, eczema is not infectious, neither does it occur in an epidemic form. Finally, eczema seldom leads to a fatal termination, while epidemic exfoliative dermatitis is always an extremely grave affection, and in the epidemic of 1891 gave a death rate of 12·8 per cent (Savill, *loc. cit.*).

Tinea Circinata.—Many cases of epidemic dermatitis might at first be mistaken for this disease, especially when the primary lesion occurs in the form of a ring, as previously described. But its short duration—from three to eight days—and subsequently the rapid spread, copious exfoliation, and definite termination of the eruption, would enable one to differentiate between the two diseases. In *tinea circinata* the microscope would reveal the trichophyton, while one skilled in microscopy might detect the diplococcus peculiar to epidemic dermatitis.

Erysipelas.—At first epidemic dermatitis may bear a close resemblance to this affection, but the absence of pyrexia, or other constitutional disturbances which are so conspicuous in erysipelas, would enable the careful observer to recognize the true nature of the disease in hand.

Rötheln.—When epidemic dermatitis begins in the form of blotches its resemblance to rötheln is quite marked. Here, too, the absence of pyrexia, and the longer duration of the rash in epidemic dermatitis, would remove any doubt one might at first entertain as to a diagnosis. Again, rötheln is more common in children, epidemic dermatitis in the aged.

Prognosis.—The gravity of epidemic exfoliative dermatitis depends upon the age and bodily vigor of the patient. As the disease shows a decided preference to attack the aged and infirm, its prognosis is necessarily grave. It has been further observed that the extent of the cutaneous lesions determines largely the amount of constitutional disturbance, and that repeated relapses are common. In Dr. Savill's report the disease was more fatal in the male sex, being 20·22 per cent, while only a fatality of 4·05 per cent is recorded in females. Tremor and twitching of the muscles, and labored respiration unaccompanied by physical signs in the lungs, are regarded as precursors of a fatal termination. According to the same authority, although convalescence is slow, yet no trace of albumin is found after recovery, and the intestinal tract regains its normal condition.

Meningitis and gangrene of the extremities have been mentioned as sequels to the disease.

Treatment.—From what is already known as to the etiology of the disease it would appear that in its treatment the first object should be to limit the pathogenic process to the primary lesion and to destroy the specific microbe *in situ*. Mr. Lunn found in the epidemic at the Marylebone Infirmary that painting the original patch with collodion arrested

the spread of the disease. Dr. Savill found the preparations of tar serviceable. Salicylic, chrysophanic, and carbolic acids are also useful during the primary stage. The first two are best used in collodion.

The disease having passed the initial stage, our efforts are directed to mitigating the itching and burning by soothing lotions, warm alkaline baths, etc. Creolin has been found a useful application in all stages, either as a one-per-cent lotion, or in an ointment of the same strength with lanolin or vaseline.

From the foregoing it will be readily seen that internal treatment has no direct influence on the course of the disease. It is necessary, however, to meet any complications that may arise, and during the second and third stages bitter tonics and alcoholic stimulants are usually called for.

DERMATITIS EXFOLIATIVA NEONATORUM. (GEORGE T. ELLIOT.)

Synonym: Ritter's Disease.

Definition.—An acute disease of the newborn, characterized by progressive implication of the cutaneous surface and excessive epidermic exfoliation, and accompanied at times by the formation of vesicles and bullæ. Though the general functional health is unaffected, the rate of mortality from secondary or other causes is nearly fifty per cent.

This fatal form of disease of the newborn has received little recognition in text-books, notwithstanding that Ritter von Rittershain, who first described it carefully, observed and studied, from 1868 to 1878, two hundred and seventy-nine cases in the Foundling Asylum at Prague. Kaposi claims that it was described previously by Hervieux, Huetter, Bille, and others, but, nevertheless, to Ritter belongs the credit of establishing the existence of the disease. Kaposi states that he has seen such cases in Vienna, and he, as well as Ritter, would separate the disease from pemphigus, with which the previously mentioned authors had confounded it. C. Boeck, in 1878, reported a case as pemphigus, while Bohn, Brocq, and Weyl merely refer to its occurrence. Behrend, in 1879, recorded seven cases, but these, however, on investigation, proved to be instances of pemphigus neonatorum and not of Ritter's disease. Caspary, in 1884, reported a genuine and typical example. In 1888, I recorded five cases, and since then (1892) I have treated still another. These are the only cases reported in America, but in 1892, Hallopeau presented an example of it before the Dermatological Society of Paris.

Symptomatology.—Ritter's disease appears in early infancy, rarely before the end of the first week, and more especially between the second and the fifth week of life. The outbreaks vary greatly in acuteness and

in the intensity of the symptoms, and in some cases are preceded by a dry, scaly condition of the skin, which had persisted after the physiological desquamation of the epidermis had occurred. The process develops quite suddenly, under the form of a diffuse redness, usually located upon the lower half of the face about the mouth, but it may also occur from the first upon some other portion of the body, or even be universal. From its starting point the hyperæmia spreads rapidly and continuously, or it appears in patches here and there, becoming ultimately universal in a short space of time, or in a few days. As a rule, the extremities are attacked the last of all. The color of the affected skin varies from a light to a dark purplish red. Synchronously with the extension of the hyperæmia, exfoliation of the epidermis begins upon the surface first attacked. The exfoliation may occur without any evidence of exudation, the epidermis being slightly thickened, wrinkled, dry, and fissured into pieces of all sizes, loosened at the edges and removable by any slight mechanical action, and underneath them a thin layer of new epidermis will be found. On the other hand, the exfoliation may be preceded by an outbreak of small vesicles like those of miliaria crystallina, or the horny epidermis may be lifted up by fluid accumulation into large, irregularly shaped, flaccid bullæ. These may burst and form crusts, or, being rubbed off, leave a raw-looking surface. In such cases, when the disease is at its height, the baby presents a most pitiable appearance, as though it had been scalded—the epidermis on some portions wrinkled and sodden-looking, on others peeling off in great ragged flakes, while large areas may be entirely denuded, the rete alone remaining.

At the same time, the buccal and nasal cavities are affected and exfoliation of their epithelium takes place, while fissures are very apt to form at the corners of the mouth. The conjunctivæ are usually injected and reddened, there is an accumulation of shreddy mucus, and, in one case of the writer's, exfoliation of both cornea occurred and led to perforation and prolapse of both irides.

After the desquamation has occurred, its regeneration takes place, at times with great rapidity. The extremities, however, do not regain their normal color for quite a while, and the skin remains scaly and irritable for some time after. In cases in which there have not been any exudative symptoms, the exfoliation and regeneration of the epidermis requires a longer time, but usually the disease runs its course in from seven to ten days. In fatal instances, the reformation of the epidermis may be complete, the child dying from some sequela; or it may be only partial, death resulting from the intensity of the disease.

Unless some internal complication exists, the process is unaccompanied by either fever or systemic disturbance. The infant's general functions are usually normal, and its weight may be stationary and even in-

creased. In severe cases, however, a marasmic condition may rapidly supervene, and, even after all the cutaneous symptoms have disappeared, the infant may become cachectic and athreptic. Relapses are occasionally observed, but they are usually mild, and develop ten to twelve days after the first attack. As sequelæ, furunculosis may be mentioned as the most common, but abscesses and phlegmonous processes, with consecutive sepsis and gangrene, may also occur.

Pathology and Morbid Anatomy.—In regard to the morbid anatomy of Ritter's disease there is little to be said. The usual symptoms of hyperæmia of the cutis and of desquamation of the horny layer are present.

Ritter held that it was pathologically a form of pyæmic infection; but his opinion is far from being satisfactory, owing to the difficulty of imagining a pyæmic process without a purulent focus as a starting point, or one so extensive and yet localized entirely in the superficial layers of the skin, or one running such an acute course without any elevation of temperature. The fact that furunculosis and phlegmonous processes occurred as sequelæ was advanced by Ritter as proof that the disease was a pyæmia; but yet their appearance, consecutive and not antecedent to the development of the process, would certainly not support that opinion. Bohn held that it was a dermatitis, but Caspary points out that it could not be inflammatory in character and run its course without pyrexia. He regarded it as an epidermolysis of unknown nature, with secondary hyperæmia of the cutis—possibly an acute disturbance of nutrition in those external layers of the skin which do not contain blood-vessels. Kaposi and Bohn think that it is connected with and represents a great increase in the physiological desquamation of the epidermis of the newborn; but while the latter regards it as a pemphigoid eruption, the former agrees with Ritter in separating it entirely from pemphigus. Brocq considers it to be a peculiar form of pemphigus, but more recently Riehl has communicated the discovery of a fungus with long, thin mycelia in connection with the disease, and concludes that it is its cause. This last suggestion of Riehl, though awaiting corroboration, is certainly the most satisfactory explanation which has yet been given. The writer has not been able to find the fungus mentioned by Riehl in the one case examined by himself, but he would be inclined to accept the parasitic theory as the most satisfactory, in view of the clinical course of the cases which have been under his care.

Etiology.—Little is known of the etiology. Bohn says it is a local process brought about by some external cause. In view, however, of Riehl's discovery, and the possibility of the disease being parasitic in nature, we may in time obtain some further knowledge concerning it.

Diagnosis.—The diagnosis offers no difficulty if the age of the patient is considered, as well as the mode of extension of the process, its superficial seat, its rapid course without pyrexia, and its desquamative features. There are several forms of cutaneous disease from which it may be necessary, however, to differentiate it. Pityriasis rubra of Hebra and the exfoliative dermatitis of Wilson may be readily excluded, as they are limited to adult life.

Erythema neonatorum and erythema infantile may be easily disposed of, the former being the diffuse general redness developing in the course of the first twenty-four hours after birth, and disappearing without desquamation; the latter, that partial or general hyperæmia which in children so commonly precedes and ushers in an inflammatory or a febrile disease.

Acute eczema, when universal, is in infants accompanied by fever, and presents polymorphous lesions, vesicles, pustules, crusts, patches of weeping, not uniformly but irregularly distributed here and there. In places, it can be seen that the patches are made up by the aggregation of these lesions, the redness not being diffuse from the outset. The child also shows that it suffers from itching, and finally the process runs a slower course, frequently relapsing in one locality or another, and some areas have a tendency to become transformed into the chronic form of the disease. Erysipelas in the newborn is, as a rule, localized, only very rarely going over the entire body. Besides, the pyrexia and general systemic participation, the chills, and the character of the cutaneous lesion, should readily distinguish it.

Pemphigus vulgaris runs a chronic course in children as well as in adults; but pemphigus simplex acutus neonatorum and pemphigus foliaceus may be mistaken for Ritter's disease.

Pemphigus simplex acutus appears also during the first few weeks of life, but it develops usually earlier, in the first few days after birth—more commonly between the fourth and the eighth and rarely after the fourteenth day. It does not begin with diffuse redness, but with an eruption of discrete bullæ upon an uninfiltrated erythematous base. These lesions appear in successive crops for a week or more, but rarely after the first month of life. Some cases of this pemphigus, however, may present very large bullæ, which become confluent, and, finally bursting, expose a cutis covered with a pulpy layer of sodden rete and epidermis shreds. Pemphigus foliaceus may resemble Ritter's disease closely, but it occurs almost entirely in adults, and runs a chronic course. The exanthemata should be readily recognized, owing to the marked hyperpyrexia, the catarrhal symptoms in measles, the angina, etc., in scarlatina, and their general course is also very different. Scarlatiniform erythema, being a desquamative process, may be recognized by the minute punctate char-

acter of the eruption in contradistinction to the diffuse redness of Ritter's disease.

Prognosis.—The exfoliative dermatitis of the newborn does not allow of a very favorable prognosis. The percentage of mortality in Ritter's two hundred and seventy-nine cases was 48·82 per cent. This excessive mortality is sufficient evidence of the gravity of the disease. The cause of death in some cases is the intensity of the attack; in others, exhaustion, secondary septicæmia, marasmus, or loss of animal heat owing to the body being denuded of its horny and protective coat. Inanition is a frequent cause, and also the development of some secondary and complicating disease. Of the writer's six cases, one died from uncheckable hæmorrhage due to the rupture of the blood-vessels of the prolapsed irides, another from a secondary gastro-enteritis, a third from loss of animal heat and inanition, and the fourth from its inability to withstand the effects of a relapse—from general debility.

Treatment.—The treatment of the process should be directed toward sustaining the vital powers of the infant by proper nourishment, the administration of tonics and other remedies indicated. Externally, fats and oils are recommended, as well as enveloping the patient in wadding or in absorbent cotton. In view of Riehl's discovery of a fungus in connection with the disease, the writer would advise some antiseptic to be incorporated with the fats or oils—boric acid, resorcin, and particularly ichthyol, which, being a parasiticide and also a keratoplastic agent, would be peculiarly indicated. The use of antiseptics would also have the effect of minimizing the risk of subsequent furunculosis, etc. These sequelæ, should they occur, require the same treatment as though they had developed independently of the previous disease.

PARAKERATOSIS VARIEGATA. (S. POLLITZER.)

An epidermic disease affecting more or less the entire integument. Our knowledge of the affection is limited to two cases which were seen in Unna's clinic at Hamburg in 1889 (Ueber die Parakeratosen im Allgemeinen und eine neue Form derselben [parakeratosis variegata], G. P. Unna in collaboration with A. Santi and S. Pollitzer, Monatsh. für p. Derm., X, Nos. 9 and 10).

The first case, a Frenchman, aged thirty-three years, had been a patient of Besnier, who had at first regarded the disease as an anomalous form of lichen planus universalis, but later found reasons for regarding it as an affection *sui generis*. The patient had always enjoyed excellent health. The affection appeared four years before on the thighs, chest, and neck, and later almost covered the entire surface except the head,

palms, and soles. It had never occasioned the slightest subjective disturbance. The greater part of the body was covered with a red exanthem, which formed an irregular network, leaving free small, irregular, sunken patches of normal skin. The affected portions were but slightly raised above the normal surface; their borders were sharp, their cuticular areas but slightly marked, their surface affected by a fine lamellar desquamation, under which the patches had a peculiar waxy, reddish hue; their color was deeper on the more dependent portions of the body, but was not strictly uniform even for the same region, varying from yellowish-red to bluish-red. The larger patches appeared to the touch decidedly infiltrated, like an erythema papulatum; the smaller resembled recent lichen planus papules.

The second case, in a healthy man aged twenty-seven, closely resembled the first in all essential features, except that the rash was, on the whole, somewhat paler than the other.

The histological examination showed the changes in both cases to be limited to the papillary layer and the epidermis. In the papillary layer there were slight dilatation of the vessels and œdema with faint signs of chronic inflammation, proliferation of the connective-tissue cells near the blood-vessels, and moderate emigration of leucocytes. The stratum spinosum was somewhat hypertrophied, and presented indications of intra- and interepithelial œdema. The stratum corneum was slightly thickened, and had a peculiarly dense appearance.

Both cases proved to be extremely rebellious to treatment, and yielded only to a vigorous course of pyrogallol, the poisonous absorption of which was combated by large doses of dilute hydrochloric acid internally.

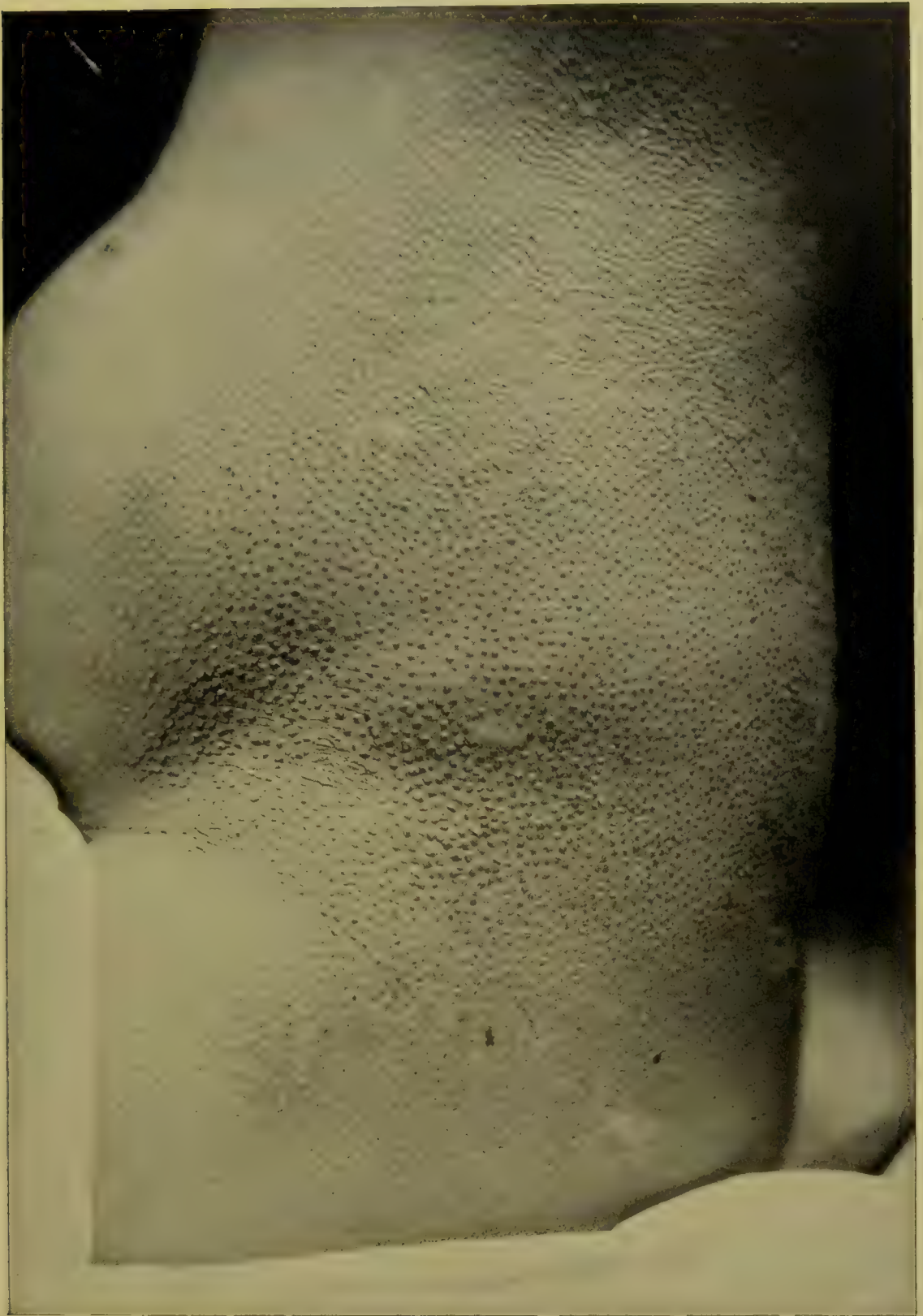
LICHEN RUBER. (GEORGE HENRY FOX.)

Synonyms: Pityriasis Pilaris (Devergie); Lichen psoriasis (Hutchinson); Lichen Ruber Acuminatus (Kaposi); Lichen Neuroticus (Unna).

Definition.—Lichen ruber is a chronic, relapsing disease, characterized by an eruption of small, reddish, acuminate papules, usually seated at the orifice of hair-follicles, and tending to form by aggregation large patches covered by fine whitish scales, and marked by an exaggeration of the natural furrows of the skin. The disease runs a slow, irregular course, often improving, but usually terminating fatally.

The terms *lichen ruber*, *lichen planus*, and *pityriasis rubra pilaris*, and the diseases to which they are applicable, have been the occasion of considerable discussion for several years. The relationship of these affections is still in a certain degree of confusion, and a decided difference of opinion prevails among dermatological writers.

PLATE VII.



LICHEN RUBER PAPULOSUS.

(From the collection of photographs of Dr. George Henry Fox.)

In the work of Devergie (second edition, 1857) a new disease is described under the title of *pityriasis pilaris*. The writer states that it is essentially a superficial squamous affection of the hair-follicles affecting the extremities, and especially the follicles which form oval groups upon the dorsum of the first phalanges of the fingers, and occasionally the whole surface of the body with the exception of the scalp. It occasions thickening and redness of the skin around the follicles and the development of conical elevations, separated by healthy skin, and comparable to "goose-flesh." The summit of these conical elevations is surmounted by a minute scale, giving the skin a rough surface. The eruption is usually unaccompanied by pruritus, is preceded by scaling of the palms, and runs a chronic and more obstinate course than any other scaly affection except ichthyosis. Devergie's description of the disease, of which the above is a brief synopsis, is by no means an admirable one, but, taken in connection with the cases reported in detail, there can be no doubt as to the fact that he was writing of the disease now known as *lichen ruber* or *pityriasis rubra pilaris*.

In 1862 Hebra published in the first edition of his book on Skin Diseases a description of a disease which he claimed to be different from anything described in the dermatological works of that time, and which he called lichen ruber on account of the essentially papular character of the disease, and the fact that both the isolated lesions and the patches of aggregated papules were of a dull red hue when not covered with epidermic scales. Without doubt the cases observed by Hebra and pictured in his atlas were identical with those seen by Devergie and described under the name of *pityriasis pilaris*. But while priority of description may be claimed in behalf of the latter, the credit of first giving a satisfactory description of the new disease belongs to the former. The name selected by Hebra seems, moreover, to be more applicable to the characteristic features of the disease than that employed by Devergie.

In the second edition of Hebra's work, published in 1872, with the collaboration of Kaposi, the description of lichen ruber is faulty and misleading on account of the fact that lichen planus, a disease first made known to the profession by Erasmus Wilson, and one with which Hebra appears to have been previously unfamiliar, is described as a form of lichen ruber. This unfortunate combination of two distinct diseases under one head has been the source of much confusion in subsequent dermatological literature.

Since Hebra published his first description of lichen ruber the study of cases has added much to our knowledge of its clinical aspects, and to-day a tolerably clear idea of the disease would undoubtedly prevail had it not been for the unfortunate circumstance that a distinct disease (*lichen planus* of Wilson) has been incorporated with it in the descriptions of

many writers. Lichen ruber is clinically a protean disease. The same case seen at an interval of three months would in some instances be scarcely recognized, so great is the possible change in its clinical appearance. A description written at one time would not be at all accurate at another stage in the course of the disease; and hence two observers seeing a case at different times, or different cases of the same disease, might write equally accurate but totally varying descriptions.

The lichen ruber of Hebra and the pityriasis pilaris of Devergie would seem to have little in common; but when one has the opportunity to study for years a series of cases which present at *different times* all the essential features ascribed to either disease by French and German writers, the conclusion is irresistible that they are merely clinical forms of one and the same disease.

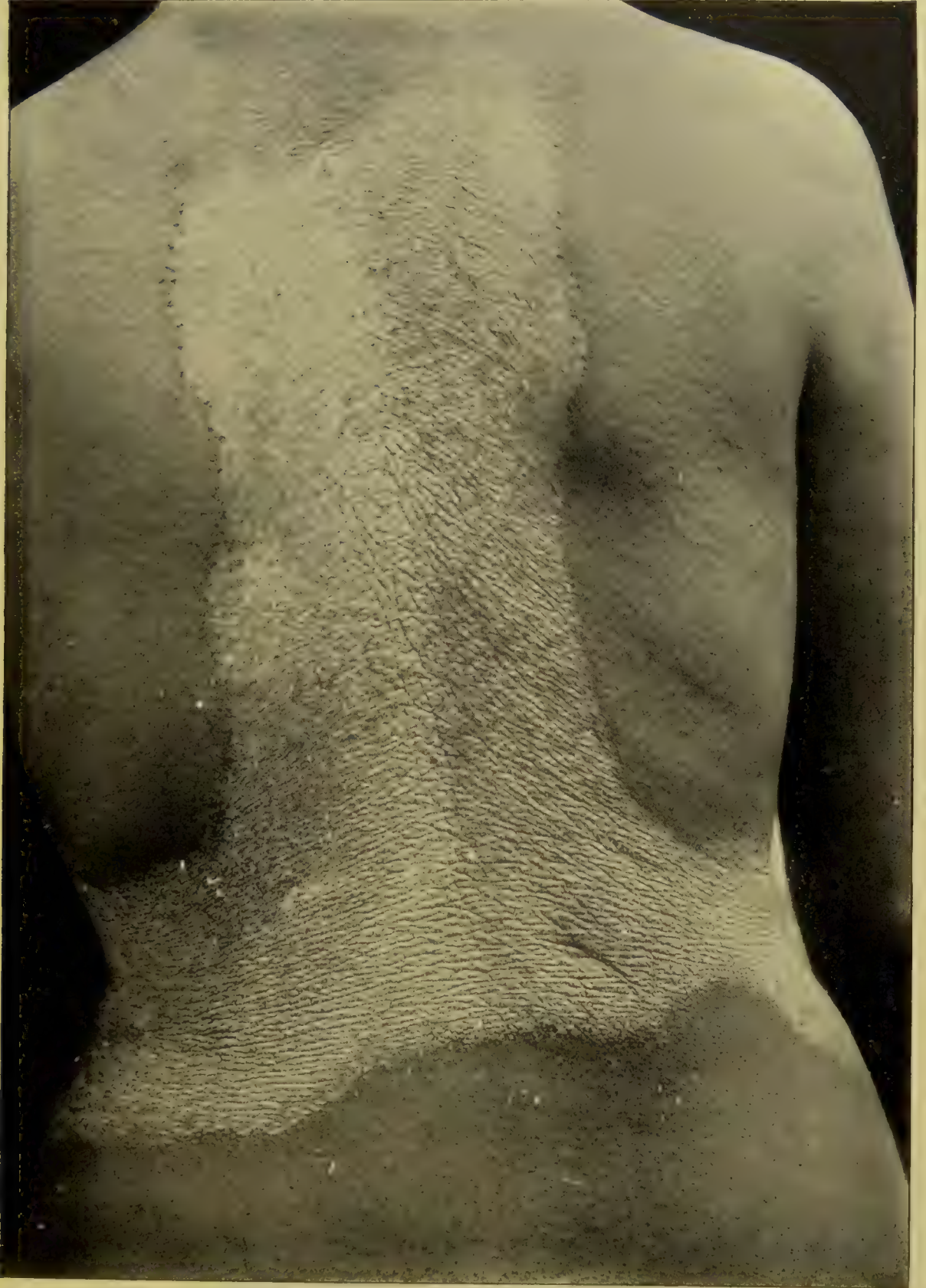
Symptomatology.—The characteristic lesion of lichen ruber is a minute, conical papule of a pale, yellowish-red hue. Its seat at the orifice of a hair-follicle is quite apparent when the eruption is in its incipient stage, and especially upon certain portions of the body—for example, the dorsum of the first and second phalanges of the fingers. In no case do the lesions show any tendency to become transformed into vesicles or pustules, and when fully developed undergo no change in size. In time, however, they lose their anatomical character by aggregation, and the papular origin of the eruption can only be determined by the disseminate lesions scattered along the border of a patch. At first the patches present a surface deeply marked by the natural furrows of the skin, especially about the elbows and knees, and the aggregation of the fine scales presents an appearance of snowy whiteness never seen in psoriasis or other squamous affections. This scaly surface, however, gradually loses its whiteness, and in time even the scales fall, and a dull red, thickened, leathery skin is exposed. The rough, scaly patches are sometimes circular in form, and upon the extensor aspect of the extremities bear a strong resemblance to psoriasis or orbicular eczema.

There are three widely different aspects which lichen ruber may present, and these may be considered as clinical forms of the disease.

Like the clinical forms of eczema, these are successive, often interchangeable, and liable to coexist upon different parts of the body. They may be conveniently described as (1) the papular, (2) the squamous, and (3) the rugous forms of lichen ruber.

In the papular form of lichen ruber the lesions are small and usually acuminate. They do not increase in size when fully developed, and never change into vesicles or pustules. They are usually follicular in their origin, of a faint reddish hue or colorless, and the affected skin at first presents the appearance of *cutis anserina*, or suggests keratosis pilaris. The lesions do not necessarily involve a hair-follicle, as early in the

PLATE VIII.



LICHEN RUBER SQUAMOSUS.

(From the collection of photographs of Dr. George Henry Fox.)

disease they are liable to appear upon the palms as well as upon the backs of the hands. Occasionally the lesions are not acuminate, but appear flattened from the outset. The parts most commonly attacked are the nape of the neck and upper vertebral region, the axillary folds, bend of elbows, palms (often sparing the central portion), dorsum of first and second phalanges, sterno-clavicular region (sparing the breasts), pubic iliac and gluteal regions, cleft of nates, knees, popliteal spaces, dorsum and soles of feet.

In many localities the papules undergo little change. The affected hairs atrophy, and the follicles become plugged with dried epidermis. This is very apparent upon the dorsum of the fingers, where the hairs grow in small, rounded groups. Upon the palms and soles, where the epidermis is thickened, the papules are not often seen, but they invariably precede the scaly condition which results from their confluence. In their development upon the palms they are apt to come first where the skin is thickest, and to form a circumscribed, whitish, scaly ring, with isolated papules gradually filling up the central portion of the palm. As a rule, however, the papules soon become tipped with minute white epidermic scales, and show a decided tendency to increase in number and to aggregate in patches.

In certain regions the movements of the body and friction of the clothing lessen the scaliness of the papules, and they may appear rounded and smooth. This condition is often seen on the back of the neck. Over the hips I have seen the skin studded with numerous discrete papules which had become flattened, smooth, and even umbilicated, thereby becoming strongly suggestive of the lichen planus of Wilson, but still lacking the angular outline and characteristic violet tint of the lesions in that disease. As the papules increase in number they flatten and tend to coalesce. Small islands of healthy skin may become inclosed, and as the disease progresses, often in an acute form, these islands grow smaller and smaller until they disappear. The papular character of the eruption is now lost, and large, roughened or scaly patches give to the disease an entirely different aspect.

In the squamous form of lichen ruber the eruption appears chiefly as white, scaly patches, of varying size and form. They are rarely numerous, as are the patches of lichen planus (Wilson), but tend to spread over large portions of skin. At first they may be small and irregular, but instead of being only slightly squamous the patches of lichen ruber are thickly covered with fine, branny scales, which give to the affected skin a peculiar snowy appearance. As the patches increase in size they tend to become spindle-shaped (over knees and ankles, for example), annular (upon the palms), or to form white, scaly bands running lengthwise along the extremities, down the vertebral portion of the back and around the waist.

These broad patches are either sharply circumscribed, or fringed with numerous isolated acuminate papules, each one tipped with a fine, white epidermic scale. In some cases many of the smaller patches, especially upon the arms and legs, assume a nummular or discoid form, the fine white scales giving place to thickened, horny plates, and the eruption becoming very suggestive of inveterate psoriasis. With the discoid patches may usually be found some bands or diffuse patches, and upon the backs of the fingers the follicular lesions usually persist. The face and scalp are often affected early in the course of the disease. A dirty-white, adherent scale forms upon the scalp, and the hair loses its luster. The face presents the appearance seen in ichthyosis. The skin is dry and pityriasic, pale if not inflamed, and the eyelids show a tendency to ectropion. The diffuse squamous patches of lichen ruber upon the trunk and extremities usually present a wrinkled or striated appearance, the lines running parallel with the natural furrows of the skin. This condition is particularly noticeable over the knees, and wherever the skin is subjected to much movement. Gradually the scales loosen and are rubbed off by the clothing, and now the eruption, if seen only at this time, might be mistaken for an entirely different disease.

In the rugous form of lichen ruber the white scales have almost entirely fallen from the patches, the snowy whiteness of the squamous stage has given place to a dull red, leathery hue, and the parallel furrows of the skin, which were faintly outlined when the patches were covered with scales, have now become the chief feature of the eruption. In many localities the infiltrated folds of skin are perfectly parallel, and present an appearance quite unlike anything seen in other affections. In other localities the furrows may run together and be broken by cross furrows, until the surface of the skin has a decidedly leathery appearance. Over the knees the infiltration of skin may be so great that the *rugæ* between the deep furrows necessarily assume a wavy appearance when the leg is extended. The hands, which early in the disease are scaly and fissured at times, may now undergo a marked change in appearance. The persistent infiltration of the skin leads to atrophy. The skin becomes drawn, making the joints appear unduly large, and seriously interfering with the use of the fingers. The nails by this time, if not before, become affected, and are either thickened and ridged or friable and shortened.

In certain cases of lichen ruber, as also in lichen planus and in psoriasis, there appears a tendency of the lesions to occur in lines where the skin has been scratched or otherwise injured. This linear arrangement of lesions is usually quite insignificant, but in lichen ruber the lines may present a raised and beaded or moniliform appearance which is very characteristic. I have only seen it occur in two cases, and in these cases the bend of the elbow and the pubic region were the parts affected. A num-

PLATE IX.



LICHEN RUBER RUGOSUS.

(From the collection of photographs of Dr. George Henry Fox.)

ber of cases which have been mentioned in the literature of this subject as cases of moniliform lichen ruber were probably cases of lichen planus with a few lesions presenting a striated arrangement.

The amount of itching in lichen ruber seems to vary in different cases and at different times. As a rule, it is very slight in the papular stage, but in the squamous and rugous cases it may be severe. Alternate shivering and burning sensations may harass the patient, especially before every exacerbation of the eruption.

The clinical forms above mentioned may be regarded as stages in the development of the eruption. It must be remembered, however, that the follicular lesions may disappear without going on to the formation of scaly patches, while the squamous form often persists in some cases for months or years, coming and going, changing its outline like the patches of diffuse psoriasis, and yet never presenting the marked infiltration of the rugous form, which may develop at an early period in other cases.

The following will show at a glance the forms and varieties which the eruption in lichen ruber may present:

- I. Papular form (*lichen ruber papulosus*).
 - a*, With discrete lesions.
 - b*, With confluent lesions.
- II. Squamous form (*lichen ruber squamosus*).
 - a*, With small irregular patches.
 - b*, With large bandlike patches.
 - c*, With discoid patches.
- III. Rugous form (*lichen ruber rugosus*).
 - a*, With parallel furrows.
 - b*, With moniliform or beaded ridges.

Pathology.—Microscopical examination of a typical papule shows that the corneous layer of the epidermis is greatly hypertrophied, the cells of the rete being incompletely transformed. There is an increase in size of the papillæ with a dilation of the blood-vessels. Robinson regards the disease as a paratypical keratosis, and differentiates it on purely pathological grounds from lichen planus and other inflammatory affections of the skin. While Besnier, Robinson, and others claim that this disease is primarily a hyperkeratosis, and regard the hyperæmia and infiltration as secondary, Kaposi claims that in lichen ruber, as in psoriasis, the hyperkeratosis is secondary.

Etiology.—The cause of lichen ruber is unknown. Those attacked by the disease are usually free from constitutional weakness of any kind, and the patient loses health and strength only when the eruption has affected the greater portion of the skin and persisted for years. The disease is usually seen in childhood and early adult life, and the male sex appears especially liable to suffer.

Diagnosis.—The clinical features of lichen ruber are so marked and characteristic that a mistake is not likely to be made when the disease is well developed, at least by one who has ever seen a case. When the papules are isolated and tipped with small white scales, a resemblance to the punctate form of psoriasis is presented, but while in the former disease the papules are invariably of uniform size, in the latter a few guttate or irregular patches are usually present. When the papules are aggregated in patches the disease might be mistaken for either diffuse psoriasis or chronic eczema, but the fine whitish scales in lichen ruber and the exaggeration of the natural furrows of the skin, especially when the scales have been removed, will suggest the correct diagnosis. Moreover, the patches of lichen ruber, though often marginate, will usually be fringed with isolated papules. They are more apt to appear in bands than in rounded and scalloped patches formed by the coalescence of small disks, as in psoriasis, and never do they exhibit the infiltration, moisture, and excoriations which are commonly present in chronic eczema.

When the whole body is affected by lichen ruber, as happens in its late stage, the atrophied and drawn condition of the skin on the hands and feet, with deformity of the nails, the reddened and peeling condition of the face, with ectropion and loss of hair, will suffice to distinguish it from universal psoriasis or eczema.

Prognosis.—The prognosis in lichen ruber is exceedingly grave. Although the disease may be improved by treatment, and even apparently cured, a relapse is certain, and in time a fatal termination of the disease may be looked for. None of Devergie's cases were reported as cured. Every one of the fourteen cases upon which Hebra based his original diagnosis of the disease terminated fatally. The comparatively favorable prognosis given by Hebra in the second edition of his work, and by many German and French writers, will be readily explained by the fact that lichen ruber, an extremely grave even if not absolutely fatal disease, has been confounded with lichen planus, a disease which, even when affecting the whole body, and proving rebellious to treatment, is never fatal, and which is likely to disappear in course of time even if untreated. Of a dozen or more cases of lichen ruber which I have had the opportunity of studying, a few have died, others have disappeared, but not one, as far as I know, has ever been cured. My own experience does not justify me in asserting that lichen ruber is an incurable disease, but it is sufficient to make me skeptical of any reported cure, until I am convinced that the case was not one of generalized lichen planus, and that the patient has been absolutely free from all symptoms of the disease for a year or more.

Treatment.—The main object in the treatment of lichen ruber is to improve the patient's general health in every possible manner. For the

PLATE X.



LICHEN RUBER MONILIFORMIS.

(From the collection of photographs of Dr. George Henry Fox.)

accomplishment of this end, certain hygienic measures adapted to the nature of the case will often do far more than medication. Indeed, the blind reliance upon the efficacy of arsenic in this as in other dermatoses is very apt to prove harmful to the patient. Possibly arsenic is the best remedy in the Pharmacopœia for lichen ruber in its incipient stage, but it will not be found advantageous to depend wholly upon it. Kaposi, who is most enthusiastic in the advocacy of this remedy in the form of Asiatic pills (three to ten daily), mentions a case of lichen ruber universalis in which the eruption disappeared after two years of continuous treatment. He offers no proof, however, that the arsenic caused the eruption to disappear, and unfortunately fails to mention how long the patient remained cured. Cod-liver oil will do more to improve the nutrition of the skin in many cases, and in the severe form of the disease it will prove of decided service. I have given Chaulmoogra oil a thorough trial in one or two cases, hoping to observe the benefit which has followed its administration in several cases of leprosy, but no advantage over cod-liver oil was noted. The alkaline diuretics will exert a beneficial effect, especially at such time as the patient complains of excessive heat in the skin, and which is usually the forerunner of a fresh eruption of papules.

The local treatment of the disease, though merely palliative, must be chiefly relied upon to keep the skin in its best possible condition and to afford comfort to the patient. Baths containing gelatin, bran, common salt, or borax, are of value, and the Turkish bath, when it can be frequently taken, will do much good. Soap frictions, followed by inunction of suet, oil, or vaseline, usually keep the skin comparatively smooth, and should be employed except when there is much cutaneous congestion. An ointment, containing about five per cent of salicylic acid, will soften and remove the scales from the patches and act with especial benefit upon the hands and feet. When itching of the skin is present, one or two per cent of menthol, or, better still, the oil of peppermint, in a lotion or ointment, will prove of decided service.

LICHEN PLANUS. (GEORGE HENRY FOX.)

Definition.—Lichen planus is an inflammatory affection of the skin, characterized by an eruption of flattened, angular, shining, dull-red papules, often presenting a central depression. These tend to coalesce and form irregular patches of a peculiar purplish-red hue, and sometimes a harsh, roughened surface.

This disease was first described by Erasmus Wilson, in the *Journal of Cutaneous Medicine*, in 1869. No previous allusion to this not uncommon affection is to be found in dermatological literature; and yet, in spite of the subsequent study which has been devoted to this disease, a

fuller or better description could scarcely be written at the present day than that given by the eminent English dermatologist. Wilson's original description of lichen planus will long remain as a marvel of careful observation and accurate statement.

Symptomatology.—The primary lesion in this disease is a papule, angular in outline when perfectly developed, flattened at the summit, smooth and shining in appearance, and usually dotted in the center by a minute pit or umbilication. It is of a dull-red hue, with a peculiar purplish or lilac tinge, which gives to the confluent patches a color which is

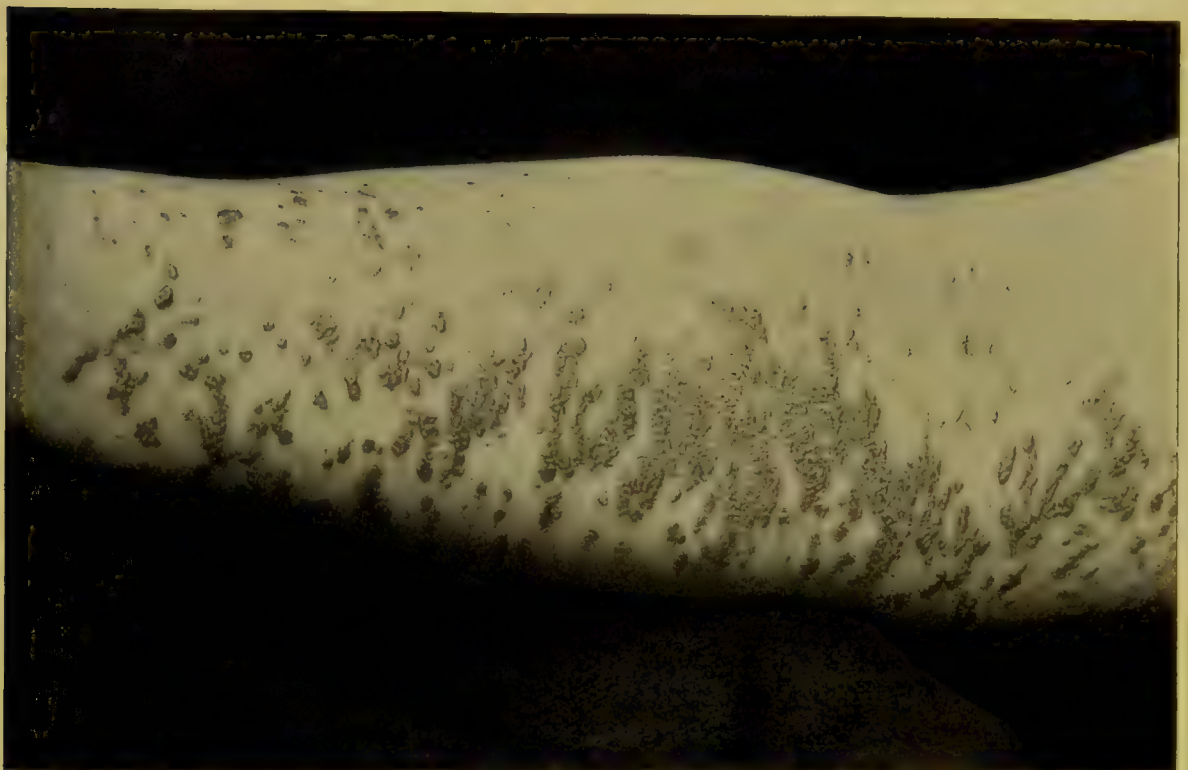


FIG. 26.—Lichen planus.

almost pathognomonic. The papules vary in size from one to three lines in diameter, and sometimes the larger ones appear annular and with a depressed center. The lesions are usually of a uniform size in a given case, but in certain cases all the papules are uncommonly large. As in the papular syphilide, both a miliary and a lenticular form might be described. The lesions are at first discrete, but show a marked tendency to aggregate and form irregular or reticulate patches of variable size. They frequently appear in lines, and occasionally tend to form circles. Although the papules of lichen planus never change into vesicles or pustules, I have seen a patch upon the tibial aspect of the leg become the seat of ulceration.

The most common site of the eruption is upon the anterior surface of

the forearm. It is also frequently seen around the waist, especially above the hips, and upon the legs. Occasionally it attacks the penis and genital regions, and may also be met with upon the mucous membrane of the oral cavity. The eruption is usually chronic in its course, and when the lesions have disappeared a decided pigmentation of the skin is often left. This is especially noticeable upon the legs, where the patches are commonly raised considerably above the surface of the skin, and present a rough surface, suggestive of a file or nutmeg grater. Though usually confined to limited portions of the skin, and tending to symmetrical development, the eruption may in rare cases cover the greater portion of the trunk and extremities. It never, however, involves the whole skin, as do eczema, psoriasis and lichen ruber in certain cases, and hence the term *lichen planus univversalis* is never strictly applicable.

To the elevated and roughened patches often seen on the lower extremities, and which differ greatly in appearance from the common form of the disease, the adjectives *hypertrophicus*, *corneus*, *verrucosus*, and *scleroticus* have been applied for purposes of description.

Itching is generally present in at least a slight degree, and sometimes becomes a very prominent and annoying symptom.

Pathology.—A section of a recent papule, examined by the microscope, shows a dense mass of round cells in the papillary layer of the corium, a thickening of the rete, and a notable absence of the corneous layer. The papules are formed usually at the opening of the sweat ducts, the orifices of which appear to give rise to the central umbilication.

Etiology.—The etiological factors in most cases of lichen planus are obscure. While many patients are of a decidedly neurotic temperament, it is difficult to say why or how this acts as a cause of the eruption. The disease is quite rare in children, and usually occurs during middle life.

Diagnosis.—Lichen planus ought never to be confounded with lichen ruber. If clinical experience were taken as a guide in place of the dictum of eminent authorities, confusion of these two diseases would be very unlikely to occur. Although in rare instances the papules of lichen ruber may appear flattened and even umbilicated, they never assume the angular form nor present the characteristic purplish hue of the papules of lichen planus. In many cases of lichen ruber there may exist at a certain period of development a few flattened and shining papules, which a careful search will detect. But quite similar flattened and shining lesions will often be found in a papular eczema of the trunk. And in psoriasis, when large patches have been partially removed by treatment, leaving a smooth red papular eruption, the lesions may bear such a strong resemblance to those of lichen planus that one unacquainted with the history of the eruption might readily err in diagnosis. But the existence

of a few flattened and shining papules does not make a case of lichen planus, nor do they indicate any relationship to this disease; nor, on the other hand, do a few obtuse or small, rounded papules which may occur in a case of lichen planus indicate that the patient has lichen ruber, or that the two affections coexist.

A diagnosis ought never to be based upon the shape of a few exceptional lesions; but even from this standpoint the lesions of lichen planus and lichen ruber differ far more widely than do those of psoriasis and papulo-squamous eczema. When all the clinical features of the two diseases are taken into consideration a sharp contrast is presented, and it seems strange that so many of our European colleagues have fallen into the error of confounding the two diseases. Lichen ruber is a relapsing affection, limited in its extent at first, but tending to involve the whole body at a later stage, readily improved by treatment, but seldom if ever cured. Lichen planus, on the other hand, is far less prone to relapses when the eruption has wholly disappeared, even in those rare cases when the greater portion of the body has been involved. It is usually rebellious to treatment, but certain to leave the patient in time even when untreated. In America, lichen planus is by no means uncommon, while lichen ruber is a very rare affection. Crocker states that, so far as his experience goes, the lichen ruber acuminatus in Hebra's sense is practically nonexistent in England. He has seen two hundred cases of lichen planus (as described by Wilson). In some of these a few conical and convex papules could be seen, but they were nevertheless cases of undoubted lichen planus.

The papular syphilide, particularly in a relapsing and atypical form and also in infants, may present such a resemblance to lichen planus that an error in diagnosis is very likely to occur, but a study of the progress of the eruption will usually discover the mistake.

From a papular eczema lichen planus may be distinguished by the angularity and flatness of the lesions, their peculiar purplish red color, especially when confluent, and by the absence of excoriations or minute blood crusts. From psoriasis it differs in possessing no tendency to the formation of circular patches gradually increasing in size nor to the accumulation of epidermic scales.

Prognosis.—Lichen planus usually runs a rather chronic course, lasting for many months in some cases, and, though usually rebellious to treatment, the eruption may disappear spontaneously and unexpectedly. A patient should, therefore, be informed at the outset of this variability in the course and severity of the disease. Beyond the annoyance occasioned by the itching, and the unsightly appearance of the eruption upon exposed parts, the patient need expect no serious discomfort, for even in cases of very extensive lichen planus the general health suffers in but

slight degree, and, unlike lichen ruber, the disease never goes on from bad to worse, terminating finally in marasmus and death.

Treatment.—According to most writers, arsenic is a sovereign remedy in all cases of lichen planus. According to my own experience, arsenic is indeed a valuable remedy in certain cases where a nerve tonic is specially indicated, but having seen many cases of long-standing lichen planus recover rapidly under an indifferent plan of treatment or no treatment at all, and having seen many other cases withstand the use of arsenic in both small and large doses, my belief in its efficacy is by no means as strong as that which commonly prevails. There is no known specific for this disease—i. e., no internal remedy which acts as surely and beneficially as does mercury in syphilis or quinine in malarial fever. The best therapeutic result can ordinarily be obtained by simply treating the patient on general principles, without any regard to the eruption on his skin, and meanwhile doing all that can be done in the way of vigorous local treatment. This constitutional treatment of the patient is of the highest importance, and too frequently neglected. The internal use of drugs may be necessary to combat certain conditions, but general hygienic treatment without any medication will accomplish far more in most cases than medicinal treatment alone.

Local treatment works well in some cases, but proves fruitless in others. In the acute form which lichen planus sometimes assumes the local remedy should be of a soothing and antiphlogistic character. The *lotio alba* (zinci sulphas 4, potass. sulphurata 4 in aqua rosæ 100), which is commonly employed with good effect in cases of acne and erythematous lupus, will be found of service in this affection. But when, as is most common, the disease has assumed a chronic character, a more stimulating plan of treatment is necessary. It would seem that chrysarobin ought to remove the infiltration of skin and cure the disease, considering its remarkable efficacy in cases of psoriasis and chronic eczema, but in lichen planus it seems to do little good. Ointments of resorcin and ichthyol may be employed, increasing the strength as the case may demand. Tarry preparations tend to lessen the itching, and salicylic acid in a ten to fifteen per cent ointment is by far the best application that can be made to the warty patches which form upon the legs.

A combination of bichloride of mercury and carbolic acid in an ointment has been extensively used at the suggestion of Unna, and good results reported. But in many cases I have known this remedy to be used persistently without the slightest benefit, and am therefore not enthusiastic as to its merits. In cases in which I have used this remedy upon one arm and treated the other arm by touching the papules with pure carbolic acid, I have found the latter plan of treatment to be more efficacious. In chronic obstinate cases light cauterization of the papules and

small patches will do all that local treatment is likely to do, and for this purpose I would recommend the use of caustic pyrozone of twenty-five per cent strength.

LICHEN SCROFULOSUS. (GEORGE HENRY FOX.)

Synonyms: *L. Scrofulosorum*; *L. Circumscriptus*; *L. Pilaire des Strumeux* (Besnier); *Perifolliculitis Tuberculosa*; *Tuberculosis Cutis Lichenoïdes*.

Definition.—Lichen scrofulosus is an eruption of minute yellowish-red papules, isolated or grouped, and occurring usually on the breast, abdomen, or back of scrofulous subjects.

Symptomatology.—The lesions in this affection are of pinhead size and slightly conical. They undergo no change until their gradual disappearance, when slight pigmentation is left behind. Though usually of a red hue at the outset, they generally become pale or of a faint yellowish-brown color, and are sometimes tipped with minute scales. There may be a slight amount of itching when the eruption is recent, but no excoriations are produced, and, as the patient suffers no discomfort, medical aid is rarely sought, and the disease is often discovered by accident. In cachectic individuals, however, the eruption often coexists with pustules upon the face and trunk (*acne cachecticorum*). The disease is most frequently met with in youth, and is almost invariably observed in those who present well-marked evidences of the scrofulous diathesis. Fifteen cases reported by Crocker were all seen in children. Boys seem to be more liable to the affection than girls. In connection with the papular eruption Hebra calls special attention to a striking pigmentation of the face resembling chloasma. The eruption always runs a chronic course, either remaining without change for many months, or disappearing and recurring upon other portions of skin.

Pathology.—The papules are located at the opening of the hair-follicles, which can be plainly seen when the accumulated epidermis is scratched away. They consist of cellular infiltration in the tissues around the hair and sebaceous follicles. When absorption of the cellular mass does not occur, the hair falls, the follicle is destroyed, and cicatricial tissue remains.

Etiology.—The evidences of struma, such as swollen, lymphatic glands, bone disease, ulcers, and a general cachectic condition of the skin, which are ordinarily observed in the subjects of lichen scrofulosus, indicate a similar origin of this eruption.

Hebra observed the disease only in males between the ages of ten and twenty-five years. While many were poorly nourished and cachectic in appearance, others were strong and in good condition.

Diagnosis.—The affection is not likely to be mistaken for any other by one who has once seen the eruption, and who bears in mind its essential features and the constitutional condition of the patient. In lichen ruber and in punctate psoriasis the lesions are more scaly, not likely to be limited to a small portion of the trunk, and more apt to undergo a speedy change in appearance. The papular form of eczema will be readily distinguished by its greater degree of inflammation and its concomitant pruritus. The miliary syphilide is rarely so limited in extent, and is accompanied by other symptoms which reveal the nature of the eruption. Keratosis pilaris occurs most frequently upon the outer and extensor aspect of the extremities, where lichen scrofulosus is rarely if ever seen.

Prognosis.—The eruption is amenable to treatment if the general condition of the patient can be improved. Cases of many years' standing can be cured in a few months by judicious measures, and even those untreated get well in course of time. The most obstinate cases are those with which cachectic acne is associated.

Treatment.—Fresh air, pure water, and wholesome food are essential to the successful treatment of the strumous taint that underlies this affection. Cod-liver oil and iodine, especially in the form of iodide of starch, will be found of value. In the local treatment, cod-liver oil was found by Hebra to be more beneficial than when given internally. Patients were rubbed with the oil from two to four times daily, and enveloped in flannel or some other texture that would not absorb the oil too readily. Crocker recommends vaseline or other emollients as preferable to the use of cod-liver oil.

DERMATITIS MEDICAMENTOSA. (PRINCE A. MORROW.)

Synonym: Drug Eruptions.

Definition.—In the proper signification of the term *dermatitis medicamentosa* embraces all congestive and inflammatory processes in the skin caused by the internal or external use of drugs.

By most modern authorities changes in the skin caused by the external or direct application of drugs to the integument are excluded from this category, and grouped under the general title of *dermatitis venenata*. This distinction has been made largely because a great many vegetable and mineral agents, not used for medicinal purposes, possess irritant properties, and are capable of causing eruptive disturbances when brought in casual or accidental contact with the skin, such, for example, as various substances employed in the chemical and mechanical arts. In the classic treatise of Prof. James C. White, entitled *Dermatitis Venenata* (Boston, 1887), the signification of this term has been enlarged

to include in addition to the agencies above enumerated, animal irritants, as the *acarus scabiei*, *pediculi*, etc., various organic and inorganic irritants, electricity, etc. It is obvious that in this line the etiological factors of dermatitis might be extended almost indefinitely, embracing the vegetable parasites, and, indeed, most external causes of skin disease.

Although the propriety of classing all forms of cutaneous inflammation resulting from the external application of drugs as *dermatitis venenata* has been generally accepted by modern writers on dermatology, yet this division is practically ignored in their description of *dermatitis medicamentosa*. It has been found impossible in practice, as it certainly is unphilosophical in principle, to differentiate effects due to the same cause of action, on the basis of its mode of application. In certain cases identical effects follow indifferently the direct application of a drug to the skin and its internal administration; for example, mercury and belladonna produce much the same character and intensity of inflammatory reaction, whether applied locally or given by the stomach. Again, the irritant effects developed by the direct application of a drug are not always limited to the portion of the integument with which it comes in contact, but may be manifest on remote parts, and are evidently consecutive to its absorption. The physiological property of absorption, which the skin possesses in an eminent degree, renders a differentiation of drug eruptions on the basis of their direct or indirect mode of causation impossible. The irritant action is the same, whether introduced endermically through the skin, hypodermically through the connective tissue, or ingested by the stomach.

Since it would involve needless repetition to describe under different headings the eruptive phenomena produced by the direct or indirect use of drugs, it will be convenient to include under *dermatitis medicamentosa* the forms of dermatitis which are caused by agents used for medicinal purposes, and under *dermatitis venenata* those caused by other organic and inorganic irritants.

In studying the phenomena of drug eruptions we find—

1. That every lesion of the skin—macules, papules, wheals, tubercles, vesicles, bullæ, pustules, ulcerations, and the highest form of dermatitis, gangrene of the skin, may be determined by the use of drugs.

2. That the same drug may produce a variety of eruptive phenomena, in one case a fugitive erythema, in another a bullous or purpuric eruption, in still another profound nutritive disturbances attended with loss of tissue.

3. That different drugs may produce in different individuals precisely the same form of inflammatory disturbance. Thus quinine, belladonna, antipyrine, and a host of other drugs, may determine identical angioneurotic phenomena.

4. That certain drugs seem to exercise an irritant action upon the

integument by virtue of their inherent properties. These effects are more or less constant and regular; they occur in a large proportion of all cases in which the drug is used, as, for example, iodic and bromic acne; they may therefore be regarded as an expression of the drug's normal specific action, as much so as its physiological effects upon other organs and tissues of the body.

5. That in the case of most drugs irritant effects upon the skin are exceedingly uncommon; their occurrence is always a surprise, and they may therefore be classed as incidental or anomalous effects, aberrations of the drug's normal action, due to some peculiarity of the individual.

General Characteristics.—The specific forms of drug eruptions will be described in connection with the special symptomatology of each drug. Certain characteristics common to them as a class may be briefly indicated.

Evolutionary Mode.—One of the most distinctive features is the rapidity with which the eruption develops and the celerity with which it vanishes after withdrawal of the exciting cause.

Eruptions provoked by external contact usually make their appearance within a few minutes or hours after the application of the irritant, depending upon the nature and strength of the irritant and the sensitiveness of the skin.

Eruptions following the ingestion of certain drugs are more variable in their development. The erythematous and exudative forms usually come out promptly and as rapidly disappear. In other cases it may require repeated and long-continued use to develop irritative effects upon the skin. Eruptions which are common and typical, so to speak, as iodic and bromic pustular lesions, ordinarily appear only after a somewhat prolonged use of the agents.

Form.—The eruption produced by many drugs has a definite anatomical form, not absolute and invariable, but sufficiently so to be regarded as typical, so that the nature of the agent employed may be recognized by the form of the lesion. Especially is this true of external irritants, as the dermatitis of chrysarobin, tar acne, the pustules of croton oil, etc. The eruptions determined by the internal use of drugs are also more or less characteristic in their forms, as the scarlatinoid efflorescence of belladonna, the rubeolous exanthem of antipyrine, the papulo-pustular lesions of bromine and iodine. Instead of these more common forms, or coincident with them, there may be an eruption of entirely dissimilar elements.

The multiplicity and variety of lesions caused by drugs, and the various combinations and arrangements they assume, create a series of clinical pictures which imitate most accurately the eruptive fevers, as well as many idiopathic affections of the skin, and renders their differentiation impossible from the objective characters alone.

Locality.—The eruptions from the internal use of drugs are commonly generalized, although there are certain regions affected from preference by individual drugs, as the wrists and joints by copaiba, the face, back of neck, and chest by bromine and iodine. These predilected regions are often the points of departure for a more general distribution of the eruption. The effects of irritants externally applied are more localized; they are usually limited to the parts exposed to direct contact, or to the vascular areas supplied by the affected nerves. In some cases the inflammatory reaction, instead of being confined to the site of application, may radiate from it as a center and spread over a wide area, or the eruption may entirely overleap these limits and be manifest in parts distant from the focus of irritation.

Course.—The course of the eruption varies; it may persist indefinitely in the same form, irrespective of the dose or duration of the exciting cause. Thus the acneiform eruption of bromine or iodine may continue practically unchanged during a prolonged period. In the majority of cases, however, the eruption becomes, under the continued use of a drug, intensified in severity, and new eruptive features are added. An erythematous exanthem may, under such conditions, be developed into a papular, pustular, or bullous eruption.

Duration.—The duration of a drug eruption is usually sharply limited by the withdrawal of the exciting cause. In some cases, where the process of elimination is inactive, it may continue to appear for some time after the use of the drug has been suspended. Its more or less rapid involution will of course depend upon the nature of the lesions and the recuperative powers of the individual. It is obvious that the slight cutaneous disturbance expressed by a simple erythema would more rapidly undergo involution than a purpura, or the more profound tissue changes represented by an inflammatory nodule or an ecthymatous ulcer. In certain diathetic conditions, where a latent predisposition to cutaneous disturbance has been awakened into activity by an irritant drug, a character of chronicity may be impressed upon the eruption—the inflammatory fluxion to the surface persisting long after the determining cause has ceased to act.

Subjective Sensations.—The disorders of sensation which usually attend drug eruptions, in some cases preceding the outbreak, are usually of a more or less pronounced pruritic character. Sensations of itching, tingling, burning, or smarting, which almost invariably accompany the erythematous and exudative eruptions, point to the nerve element as the most essential factor in their production. Exceptionally the eruption may be comparatively indolent and apruritic.

Constitutional symptoms may or may not be present. In generalized eruptions there are often present fever with headache, a general feeling of

malaise, and other symptoms of systemic disturbance, which render their similitude to the eruptive fevers most deceptive.

If the use of the drug be persisted in after indications of intolerance have declared themselves, a high grade of constitutional reaction may be manifested. In exceptional cases, particularly after the use of arsenic and iodine, death has resulted.

Etiology.—Only the predisposing causes of drug eruptions need be considered. Climate, age, sex, heredity, and other conditions which play a more or less prominent *rôle* in the production of many skin affections, exert only an indirect influence as contributory causes.

Age and sex seem in no way to dispose to the irritant action of drugs upon the skin, except from the accident of greater fineness and delicacy of structure. Women and children have naturally finer, more sensitive skins, which render them susceptible to all causes of irritation. This susceptibility is intensified in children from their liability to congestive and inflammatory disorders from reflex disturbances of the nerve centers.

There is undoubtedly a neuropathic predisposition. It has been observed that persons endowed with a delicate nervous organization, persons suffering from the various forms of neurasthenia, in whom the reflexes are weakened and more excitable, are peculiarly prone to eruptive disorders from drugs.

Certain diathetic conditions also exert a marked influence in determining drug eruptions. In the subjects of the eczematous diathesis this predisposition is particularly marked. The slightest exposure to external irritants or the internal use of certain drugs, causing an inflammatory fluxion to the surface, may provoke into activity a latent eczema.

The most powerful predisposing cause of the determination of the irritant effects of drugs to the cutaneous surface is idiosyncrasy. So far as we can comprehend the nature of this mysterious agency as a pathogenetic factor it would seem to consist in an abnormal susceptibility of the skin to irritant influences. This may be due to functional or structural peculiarities which enfeeble its capacity of resistance, constituting a native debility of this organ, or it may reside in a peculiarity of the nervous organization, characterized by an abnormal sensitiveness or vulnerability of the vasomotor system.

Pathogeny.—The many ingenious and elaborate theories which have been advanced in explanation of the pathogeny of drug dermatitis have not modified the views first put forth by the author (*Jour. of Cutan. and Ven. Dis.*, 1885) and afterward incorporated in the first edition of his work on *Drug Eruptions* (1887). Only a brief *résumé* of these views will here be given.

Dermatitis caused by External or Direct Contact.—The cutaneous changes caused by the external application of drugs admit of a simple

explanation. The drug acts just as caloric or mechanical irritants do upon the nerve element alone. The irritation of the peripheral extremities of the sensory nerves causes a paralysis of the vasomotors of the vascular area affected, which results in dilatation of the blood-vessels, which may go on to inflammation of the skin with exudation and the formation of vesicles or bullæ. When the dermatitis is not confined to the seat of application, but spreads over a large contiguous surface, it is probable that the centripetal irritation is communicated to the vasomotor center of the spinal cord, which is reflected over wider vascular areas. When the inflammatory phenomena are manifested at a distance from the focus of irritation they are evidently consecutive to absorption of the drug, and have the same pathogenetic mode as eruptions which follow the ingestion of drugs.

Eruptions from the Internal Use of Drugs.—When a drug is introduced into the system by way of absorption, either through the skin, subcutaneously, or by the stomach, its effects are more generalized, since it stimulates the nerve centers as well as the peripheral nerves.

A large proportion of drug eruptions present the characters of simple cutaneous congestions associated with sensory disturbances more or less severe. They appear suddenly, and may affect only certain cutaneous regions; or they may become generalized, accordingly as the disordered innervation is limited to particular vascular areas, or involves the entire cutaneous vascular system.

In some cases, no doubt, the inflammatory phenomena are purely of a reflex character, analogous to *urticaria ab ingestis*, the point of departure of which is irritation of the sensory nerves of the gastro-intestinal mucous membrane. In the large proportion, however, they are secondary to absorption of the drug, and due to the influence of an irritant circulating in the blood upon the vasomotor centers of the peripheral nerves. Whether this influence be exerted primarily upon the vasodilator or the vasoconstrictor nerves, the ultimate effect is vascular dilatation, and, if the impression be sufficiently intense, exudation. The erythematous, morbiliform, scarlatiniform types of eruption are essentially angioneurotic phenomena, and have the same pathogeny as erythemas in general.

In many cases the severer forms of eruption are the outgrowth of these simpler forms—the grade of intensity depending upon the continuance of the morbid stimulus. Thus a simple erythema may, under the prolonged use of a drug, be developed into an intense dermatitis, with exudation and the formation of papular, vesicular, or bullous lesions.

There is still another class of cases in which the long-continued use of a drug occasions marked structural alterations in the skin. These severer forms, characterized by a disturbance of local nutrition more or less profound, are probably due to an impression of the drug upon the trophic

centers which regulate nutrition. Such nutritive or trophic modifications more commonly occur from the use of bromine and iodine, and are frequently associated with other disorders of the central nervous system, due to the depressant action of these drugs upon the brain and spinal cord.

In this connection brief reference may be made to the theory advanced by some observers, that the phenomena of drug eruptions are essentially those of an excretory dermatitis. This theory assumes that certain drugs are eliminated by the cutaneous glands, principally the sebaceous, and that in the process of excretion they cause various pathological modifications from local irritation. Anatomical investigations of iodine lesions have shown, however, that there was no implication of the sebaceous glands and hair follicles. Negative evidence is also found in the fact that these lesions occur in cicatricial tissue and in regions where no sebaceous glands exist. Behrend's theory that certain drugs after absorption undergo a chemical transformation into toxines, which, circulating in blood, are the efficient cause of the irritative changes in the skin, may be dismissed as fanciful and unproved.

Further, it may be said that the only correct interpretation of the physiological predisposition, known as idiosyncrasy, as the most essential cause of drug eruptions, is based upon a recognition of their neurotic character. As far as we can apprehend the nature of idiosyncrasy in this relation, it would seem to depend upon a heightened susceptibility of the nervous system to the irritant action of certain drugs, associated with a specific predisposition of the cutaneous tissues to irritant impressions. In persons who manifest an idiosyncratic intolerance to certain drugs the equilibrium existing between the cutaneous and nervous systems, in their vascular and nutritive relations, is easily disturbed, and inflammatory or trophic changes of the skin result.*

Symptomatology. Acidum Benzoicum.—Various forms of eruptive disturbance—erythematous, maculo-papular, and urticarial—have been observed from the *internal* use of benzoic acid. The inhalation of Friar's balsam produces an urticarialike eruption of the extremities (Fox).

Acidum Boracicum.—An erythematous eruption has been observed from the use of boracic acid, used in the washing out of the pleural cavity, also as an injection in chronic diarrhœa. Papules and bullæ have also been observed. A diffuse erythematous, morbilliform eruption, also eczematous eruptions, have been recorded from the ingestion of borax (Fox). The long-continued use of borax produces an eruption consisting of scaly patches, quite characteristic of psoriasis.

* For a more extended account of the pathogenesis of drug eruptions the reader is referred to the author's work, *Drug Eruptions*, edited by T. Colcott Fox, and republished by the New Sydenham Society, London, 1893.

Acidum Carbolicum.—A variety of eruptive disturbances has been observed from the general employment of carbolized dressings in the antiseptic treatment of wounds. The most common form is an erythema manifest around the point of application, especially upon surfaces where the skin is fine and delicate. The eruption may extend from the region of application over contiguous surfaces and become generalized. The inflammatory reaction may result in the formation of vesicles, and even the production of gangrene of the skin.

Acidum Nitricum.—A fine pustular eruption sometimes appears upon the skin after the *internal* use of nitric acid in medicinal doses. Its *external* use also produces papular, pustular, and ulcerative lesions.

Acidum Salicylicum—Sodii Salicylas.—The use of salicylic acid as an antiseptic is frequently attended with the production of a vesicular eruption, usually limited to the surface covered by the dressing. Erythematous, urticarial, vesicular, pustular, and petechial eruptions have been observed from the *internal* use of both salicylic acid and salicylate of sodium. Herpetic and pemphigoid eruptions, and in one case gangrene of the lower extremities, occurred from its use. An urticarial eruption has been observed from the use of salol.

Acidum Tannicum.—An erythematous eruption, affecting the face and neck, has been observed from the use of tannic acid. Tannic acid applied to the pharynx has been followed by serious œdema of the larynx and general urticaria. The same result has followed the application of tannin in a nasal douche (Fox). I have observed two or three cases of an eczematous eruption about the forehead, presumably caused by the tannin in the leather hat-band.

Aconite.—Vesicles, pustules, and bullæ have been observed from the *internal* use of this drug. *Externally*, its application has produced a vesicular dermatitis and an erysipelatous inflammation.

Alcohol.—A generalized erythema and urticaria have been recorded by Hyde and Kaempfer from the use of alcohol (Fox).

Amygdala Amara.—Eruptions of an erythematous and urticarial character have resulted from the *external* application as well as the *internal* use of bitter almonds.

Anacardium.—The oil of the cashew nut is intensely irritant, producing dermatitis characterized by papules, vesicles, pustules, bullæ, with œdematous infiltration. An erysipelaslike eruption has also been recorded from its use.

Antifebrin (Acetanilide).—Many cases are reported in which toxic effects, with the production of cyanosis, have resulted from the use of antifebrin (Fox).

Antimonium.—An eruption resembling the lesions of variola or small-pox results from the *external* application of tartarized antimony. Pus-

tular lesions may develop on parts distant from the original point of application, which are evidently due to absorption of the drug. Urticarial and vesiculo-pustular eruptions have been observed from the *internal* use of antimony.

Antipyrine.—A more or less general and symmetrical erythematous eruption frequently follows the use of antipyrine. It is most marked upon the chest, abdomen, and back. It is attended with itching and profuse sweating, and occasionally followed by desquamation. Spitz collected fifty-two cases; of these, forty-one were morbilliform, four urticarial, and the others papular erythema—scarlatiniform. Bullous, furuncular, and purpuric eruptions have also been observed from the ingestion of this drug.

Argenti Nitras.—A leaden-blue or violet-gray discoloration follows the application of lunar caustic to the mouth and throat. Workers in silver are very subject to localized argyria (Fox). A grayish-black discoloration may be occasioned by the prolonged ingestion of nitrate of silver. An erythemato-papular eruption has also been observed from the continued use of this drug.

Arnica.—The most common form of arnica dermatitis is an erythemato-vesicular eruption, resembling the poison-ivy eruption, attended with a sensation of burning and intense itching. Cases are reported in which bullæ and blisters, terminating in gangrene and causing destruction of tissue, resulted from the application of tincture of arnica. Purpuric eruptions and violent erysipelaslike inflammation, terminating fatally, have resulted from the application of arnica.

Arsenicum.—The application of arsenic to the skin occasions inflammatory redness, and, if the contact be continued sufficiently long, vesicles, pustules, and destruction of tissue have resulted. The use of arsenic in the form of lotions for the complexion, dusting powders, and pastes produce various degrees of dermatitis. The various industrial uses of arsenic in the manufacture of artificial flowers, cards, boxes, wall paper, fixing dyes, etc., occasion numerous eruptive forms of disorder. Arsenic eruptions are situated upon parts exposed to contact with the irritating cause. The genital surfaces are peculiarly susceptible to the irritant action of arsenic. Frequently there are large ulcers with œdema and gangrene of the scrotum.

Almost every form of eruptive disturbance has been observed from the *internal* use of arsenic; erythematous, papular, urticarial, vesicular, erysipelatos, pustular, and petechial eruptions; boils, and carbuncles have also been observed. Among the effects of arsenic upon the skin may be mentioned certain grayish or brownish discolorations, which are especially liable to occur upon the face, neck, and abdomen after its prolonged use. It has been noted that when psoriasis is cured by arsenic, a marked pig-

mentation, limited to the sites of the eruption, may persist for a long time. Thickening of the horny surfaces of the palms and soles, and thickening over the knuckles and elbows, giving a slight resemblance to psoriasis, has been observed from the prolonged use of the drug.

Herpetic eruptions have been recorded by numerous observers. Hutchinson reports a large number of cases in which herpes zoster resulted from ingestion of arsenic in medicinal doses, due, doubtless, to its action in exciting peripheral neuritis.

Balsamum Peruvianum.—The *external* use of the balsam of Peru has caused eruptions of an erythematous, urticarial, and eczematous type.

Belladonna—Atropia.—The most characteristic effect of belladonna upon the skin is the production of a diffuse erythematous or scarlatini-form eruption. Diffuse or patchy flushing of the face, neck, and trunk are also frequently observed (Fox). Erythema and partial gangrene of the scrotum have been recorded from the *internal* use of belladonna.

The *external* or local use of belladonna also occasions an inflammatory redness. I have recently had under observation a patient in whom the application of a belladonna plaster over the knee produced an intense dermatitis, with the production of vesicles and bullæ. Vesicular eruptions with an erysipelaslike inflammation about the lids and face, are frequently observed by ophthalmologists from the solution of atropine used as an eye-wash.

Benzole.—The application of benzole as a parasiticide on a sensitive surface causes a more or less intense erythema, attended with pain.

Bromine and its Compounds.—The most characteristic effect of the ingestion of the bromine compounds is the production of papulo-pustular lesions, which are commonly spoken of as "bromic acne." This eruption is most generally upon the face, chest, back, and scalp, affecting by preference regions rich in sebaceous glands. It may, however, be more generally distributed. There is a tendency to the formation of conglomerate lesions by confluence, consisting of flattened elevations covered with closely aggregated pustular points, suggestive of a carbuncle. Erythematous, urticarial, furuncular, and anthracoid, also vesicular and bullous forms of eruption, may occur. Papillary hypertrophy, closely simulating condylomata, may follow or accompany the eruption (Fox). Ulcerative lesions, consisting of large, irregular, raised patches, have also been observed. Crocker states that there is a marked predilection for the eruption to occupy scar tissue. The lesions are sometimes nodular in character, resembling erythema nodosum. The severer forms of bromic eruption are almost always associated with other symptoms of bromism.

Calx Sulphurata.—The *internal* use of the sulphide of calcium may cause vesicles, pustules, and furuncles of the healthy skin. I have observed a hæmorrhagic eruption, consisting of pinhead to pea-sized pe-

techiæ localized upon the lower extremities, from the use of sulphide of calcium in small doses. The eruption was developed a second time by the same drug.

Cannabis Indica.—Hyde reports a case in which an eruption of thickly disseminated vesicles with clear contents, from a pin's point to a pea in size, attended with considerable itching, and generally distributed, occurred from the use of cannabis Indica.

Cantharides.—The most characteristic form of cantharidal dermatitis is a vesicular or pemphigoid eruption, uniting to form large blebs containing a pale-yellow, watery fluid. Not infrequently troublesome pustulation results from the application of a cantharidal blister. Ulceration, furuncles, and gangrene of the affected surface have been observed. The development of erythematous pustules over the entire body has followed the application of a blister. Erythematous and papular eruptions may follow the *internal* use of cantharides.

Capsicum.—Capsicum applied to the skin *externally* is a powerful rubefacient, and will blister if applied sufficiently long. Erythematous, papulo-vesicular eruptions have been recorded from its *internal* use.

Chinoline.—An erythematous rash was observed in six out of twenty cases of typhoid fever treated by chinoline (Fox).

Chloral Hydrate.—Various forms of eruptive disturbances, mostly of an erythematous type, have been recorded from the use of chloral. The chloral rash is strikingly suggestive of the scarlatina exanthem. This similitude is heightened by the congestion of the conjunctivæ and buccal mucous membranes, increased sensitiveness of the skin, high fever, and the more or less abundant desquamation which follows. Papular, urticarial, petechial eruptions, also deep ulcers with the formation of blisters, have been observed from its use. Woodman mentions ulcers of the cornea, ulcers of the tongue, boils, and carbuncular affections, due to chloral given to children (Fox).

Chloralamide.—A punctate hyperæmia generally diffused over the surface, with vesicular lesions, has been observed from the *internal* use of chloralamide. The rash was accompanied by febrile reaction, hyperæmia of the mouth, running from the nose, and was followed by desquamation (Fox).

Chloroform.—An erythematous rash, either punctate or blotchy in character, is frequently observed from the inhalation of chloroform. Three cases in which purpuric spots were formed under the inhalation of chloroform are recorded.

Chrysarobin.—The application of chrysarobin to the skin may be followed by a dermatitis of varying intensity—a coppery-red erythema, extending a considerable distance beyond the site of its application. Papular, pustular, and furuncular forms of eruption have been observed.

An erysipelatous condition, with swelling and puffiness of the face, causing closure of the eyes, has been observed from the use of this drug. An exfoliative dermatitis of two months' duration has also been recorded from its free application. Chrysarobin conjunctivitis not infrequently results from the application of this agent to the face and scalp.

Cod-Liver Oil.—A vesicular eruption, and also an acneiform eruption, have been observed from the use of cod-liver oil.

Condurango.—Furuncles and acneiform lesions have been observed from the internal use of condurango.

Conium.—Erythematous, papular, and erysipelatous eruptions from the *internal* use of this drug have been recorded.

Copaiba and Cubebs.—The ingestion of these drugs is occasionally followed by an eruption of an erythematous character. The most common form consists of rose-colored, irregular, slightly raised patches, resembling measles. The rash manifests a predilection for the wrists, ankles, knees, hands and feet, breast, and abdomen. Papular, urticarial, vesicular, bullous, and petechial eruptions have also been recorded from the use of these drugs.

Digitalis.—An erythematous or papular eruption may follow the *external* application of the fresh leaves of foxglove in the form of an ointment. A scarlatiniform and papular erythema, an erysipelatoid affection of the face, and urticarial eruptions have been recorded from the ingestion of digitalis.

Dulcamara.—Erythematous, urticarial, "red scaly" eruptions have been recorded from the ingestion of this drug.

Ergot.—A vesicular eruption with petechiæ, also pustular and furuncular inflammations, circumscribed gangrene of the extremities, have resulted from the *internal* administration of ergot. Hypodermic injections of ergot cause painful, black swellings, and even a phlegmonous inflammation.

Ferrum—Iodide of Iron.—An acneiform eruption, appearing mostly upon the face, breast, and back, has been observed from the use of the iodide of iron. Erythematous, vesicular, urticarial, and pustular eruptions have also been recorded.

Guarana.—Urticaria has been observed after the use of guarana.

Guaiaicum.—A miliary, erythematous eruption, closely resembling the ordinary copaiba rash, has been observed from the use of this drug (Fox).

Gurjun Oil.—An eruption resembling the copaiba rash has been recorded from the use of this oil (Fox).

Hydrargyrum—Mercury.—The application of mercury to the skin in the form of an ointment frequently causes an erythema or vesicular eruption known as "mercurial eczema"; sometimes intense dermatitis and sloughing. The use of corrosive sublimate dressings may occasion papulo-

vesicular eczema and general erythema. Hypodermic injections of calomel have been followed by erythematous eruptions. Universal exfoliative dermatitis from mercurial inunction has also been recorded. A bullous eruption has been observed after an intra-uterine injection of the perchloride. Urticaria, herpes, impetigo, purpura, furuncles, with ulcerative lesions, have been recorded as due to the internal administration of mercury.

Hyoscyamus.—An erythematous eruption with œdema and urticarial wheals, a purplish rash attended with œdema, also scarlatinal, pustular, and purpuric eruptions, have been observed from the ingestion of hyoscyamus.

Iodine and its Compounds.—The effect of iodine upon the integument, *locally* applied, is well known. It produces a brownish-yellow stain, and erythema followed by desquamation. Papulo-pustular and bullous eruptions occur on distant parts of the body. The *ingestion* of the iodides gives rise to almost every form of cutaneous lesion. Erythematous, papular, urticarial, vesicular, bullous, anthracoid, petechial, nodular, and polymorphous eruptions have been observed from its use. The pustular eruptions are the most characteristic. They follow in a certain proportion of all cases in which the drug is administered, and present certain analogies with the acneiform lesions produced by the bromides. They most often occurs upon the face, back, and shoulders, and in regions where sebaceous glands are abundant, but may have a more general distribution. The lesions may be either discrete or confluent. By the aggregation of these pustules are formed the anthracoid lesions, which frequently take on a papillomatous character. Vesicular and bullous lesions are much rarer than the pustular form. The bullous form may be ranked among the rarer cutaneous manifestations of the iodides. The bullæ are of variable size, and are often commingled with vesicles and pustules. Not infrequently they run together, forming blebs of large dimensions. Cardiac and renal complications have been noted in many cases. Purpuric eruptions are frequently observed during the administration of the iodides for syphilis. Large, nodular eruptions, resembling erythema nodosum, are also recorded.

Iodoform.—The *external* application of iodoform produces eruptive disturbances similar in character to those that follow the ingestion of the iodides. The eruption is usually of the erythematous character, but the inflammation may proceed to the development of vesicles and bullæ. Erythematous, papular, urticarial, and petechial eruptions have also been observed. Iodoform eruptions are usually confined to the site of application of the drug, but the dermatitis may spread from this as a center and become diffused over extensive areas. From the *internal* use of iodoform no eruptive accidents have been recorded.

Ipecacuanha.—The *external* use of ipecac, if prolonged, causes irritation, and the formation of papules, vesicles, and pustules. Turner describes a case in which an erysipelaslike eruption, from the internal use of ipecac, covered every portion of the body. Circular patches, with elevated, thick, rounded edges, and of a fiery color, characterized the eruption.

Jaborandi and Pilocarpine.—The effect of these drugs upon the skin is noted in the production of diaphoresis. Erythematous macules, wheals, and minute papules have also occurred as a result of their administration.

Kava Kava.—I have observed in the Hawaiian Islands numerous cases of the so-called “ava skin.” The irritant effects of the juice of the *piper methisticum*, which is almost universally used as an intoxicant drink among the natives of the South Sea Islands, are manifest in the production of redness and dryness of the surface, with exfoliation of the epidermis in the form of white, branny scales. Sometimes the scales are as large as the finger nail, or larger, and so abundant that a considerable quantity may be exfoliated in twenty-four hours. The nutrition of the skin is often seriously interfered with, and ulcerative lesions, leaving scars, result.

Oleum Cadini.—The external use of oil of cade often causes an erythematopapular eruption, which may extend beyond the original point of application, and involve a large extent of surface. This dermatitis not infrequently takes on an erysipelaslike form, through the implication of the lymphatic vessels in the inflammatory process.

Oleum Morrhue.—The internal use of cod-liver oil may give rise to a vesicular eruption, usually of the erythematous type. An eruption resembling acne has also been observed from its use.

Oleum Ricini.—The ingestion of castor oil has been followed by the production of erythema, attended with marked pruritus.

Oleum Santali.—A general petechial eruption has been observed from the ingestion of the oil of sandalwood.

Oleum Tiglii.—The *external* use of croton oil, as is well known, causes redness and papules, rapidly changing into vesicles and pustules, the lesions resembling those of variola in their globular form, and occasionally umbilication. A secondary vesicular dermatitis may appear upon the face and genitals when distant parts of the body are rubbed with the croton oil. This may be consecutive to absorption, or the accidental transference of the oil by the fingers or otherwise.

Opium and its Alkaloids.—A scarlatinoid erythema, wheals, and occasionally intense pruritus, with more or less œdema followed by desquamation, have been observed from the use of opium. The eruption is sometimes macular, like that of measles. Cases have been reported in which a violent attack of urticaria was occasioned by the use of laudanum as an

enema. An exudative, erythematous eruption is the most frequent form of morphine dermatitis. Wheals, with œdema of the face and eyelids, vesicles, pustules, and furuncles and carbuncles, have been reported. Hypodermic injections of morphia are frequently followed by inflammation and dermic abscesses, which may give rise to indolent ulcers.

Phenacetin.—A generalized, erythematous exanthem, most marked on the arms and legs, has been observed from the ingestion of phenacetin (Fox).

Phosphoric Acid.—The irritating effect of phosphorus upon the skin has been observed in the form of flushings; bullous, purpuric, and pemphigoid eruptions may also result from the use of the drug.

Pimpinella.—A case of urticaria has been recorded from the use of twenty-drop doses of tincture of pimpinella. A repetition of the drug evoked the eruption a second time (Fox).

Pix Burgundica.—An inflammation of the skin of a vesicular or pustular character, and a generalized eczema, have been observed from the prolonged application of Burgundy pitch plasters. Erythema papulatum has also been observed from its use.

Pix Liquida—Tar.—The *external* application of tar may cause an erythematous, papular, vesicular, or pustular eruption. The tar acne, which so often develops in connection with the application of tar, consists of small, hard, red nodules, involving the hair-follicles. It usually persists a long time after the application of the agent. The eruption is readily distinguished from ordinary acne by the black, tarry point which occupies the center of each papule. The *internal* use of tar produces a copious red rash upon the skin. An erythematous eruption, rubeoloid and urticarial in character, has also been reported from the use of Guyot's tar capsules.

Plumbum—Plumbi Acetas—Plumbi Carbonas.—The *external* use of the lead preparations may produce brownish or blackish discolorations of the skin. Erythematous and petechial eruptions have been observed from the *internal* use of the salts of lead.

Podophyllum.—Workers in podophyllum peltatum are liable to suffer from a cutaneous eruption, affecting more particularly the scrotum and genital parts. Rubefacient and vesicant effects have also been observed.

Potassii Bichromas.—The industrial use of this agent causes papular and pustular eruptions on the exposed parts; deep ulcers and sloughs; rhinitis, followed by ulcerations of the mucous membrane of the nose and perforation of the septum.

Potassii Chloras.—A "fiery red," erythematous, and papular eruption, simulating erythema multiforme, has been reported from the *internal* use of chlorate of potash. Bluish spots on the skin, sometimes a general cyanosis, have also been observed from its prolonged use.

Quinine.—A variety of eruptive phenomena results from the *external* contact or *internal* use of cinchona and its preparations. The prevailing type of the quinine exanthem is erythematous, but almost every form of elementary lesion has been observed from the ingestion of the drug. In an analysis of sixty cases of quinine dermatitis I found that there were thirty-eight erythematous, twelve urticarial, five purpuric, and two vesicular and bullous eruptions. They are attended with severe itching, and frequently followed by desquamation. In some cases exfoliation of the epidermis in large lamellæ, giving a complete cast of the fingers like a glove, are recorded. Gangrene, more especially affecting the scrotum, has followed its use. In some cases the swelling of the face and limbs has been so marked as to suggest erysipelas. The quinine exanthem derives its general clinical importance from its close resemblance to the rash of scarlatina.

Resin.—Swelling of the face, followed by urticaria, with small wheals on the chest and arms, have been observed from the use of resin (Fox).

Rhubarb.—A generalized and desquamative recurrent scarlatiniform exanthem has been observed from the ingestion of rhubarb.

Santonine.—A generalized eruption of urticarial lesions, seated upon a reddened surface, accompanied by œdema and followed by desquamation, have been reported from the ingestion of santonine.

Stramonium.—An erythematous and scarlatiniform, also petechial and erysipelaslike inflammations have been observed from the internal use of this drug.

Strychnia.—A scarlatiniform rash, also the production of pruritus and miliaria, have been recorded from the internal use of strychnia.

Sulphonal.—A scarlatiniform eruption, spreading symmetrically and attended with intense itching, followed by desquamation, has been recorded from the use of sulphonal. Morbilliform eruptions and purpuric patches on the limbs have also been observed (Fox).

Sulphur.—A dermatitis, characterized by the production of papules and vesicles, may result from the use of a strong ointment, lotion, or vapor of sulphur.

Tanacetum.—A varioliform eruption has been observed from the use of the oil of tansy.

Tannin.—A generalized urticaria has followed the use or the topical application of tannin to the pharynx.

Thapsia.—Thapsia plasters cause rubefaction and intense miliary or erysipelaslike eruptions. I have observed a pustular eruption on the face from the application of a thapsia plaster to the chest.

Tuberculine.—According to Crocker, the ingestion of tuberculine is sometimes followed by an eruption in the form of diffuse redness, like scarlatina, or larger papules, like measles. Irregular patches of erythema

may appear scattered about the trunk. The eruption is sometimes followed by desquamation. A severe generalized eruption of psoriasis has been reported in a number of cases in which tuberculine was used in the treatment of leprosy.

Turpentine—Terebene.—The *external* application of turpentine produces redness, vesicles, blisters, and other inflammatory changes. The vapor of turpentine also produces a burning, erythematous eruption.

More or less generalized eruptions have been observed from local frictions with terebinthinate preparations (Fox).

The *internal* use of turpentine causes a generalized erythema, scarlatinlike eruptions, vesicular and papular dermatitis. Pustular eruptions of the eczematous type may also result. The ingestion of terebene, one of the derivatives of turpentine, has been observed to produce a profuse, bright red papular rash, accompanied by intense itching.

Valerian.—An attack of urticaria followed the ingestion of eau de Seltz in a patient of Dr. Frank (Fox).

Veratrum Viride.—This drug used *locally*, in the form of an ointment, may cause burning erythema, even pustular and petechial eruptions. Hypodermically, painful swellings and the formation of abscesses have been observed. The *internal* use of veratrum viride may occasion an erythematous condition of the skin, attended with painful sensations. A pustular eruption on the face has also been observed from its use.

Diagnosis.—Drug dermatitis is an accurate imitator of many idiopathic as well as symptomatic affections of the skin. The diagnosis of the dermatitis determined by the *external contact of drugs* is rarely attended with difficulty. The limitation of the inflammation to the site of application or contiguous surfaces, which is commonly the case, and a knowledge of the characteristic forms of dermatitis peculiar to certain drugs, are usually sufficient for the identification of the exciting cause.

The eruptions caused by the *internal use of drugs* derive their chief clinical importance from their objective identity with the exanthems of the specific fevers. This morphological resemblance may be heightened by the febrile disturbance and other constitutional symptoms occasionally present. Only a few of the more important diseases simulated by drug eruptions will be noted here.

The scarlatiniform eruption of belladonna, quinine, chloral, morphia, etc., may be distinguished from scarlatina by its sudden onset without prodromic symptoms, the absence of fever and high temperature, and its rapid subsidence upon the suspension of the medicine.

The rubeolaform eruption of antipyrine, copaiba, etc., may be differentiated from measles by the same negative evidence. In the case of copaiba eruption, the predilection of the rash for the wrists and ankles

and the exhalation of the resinous odor of the drug will serve to identify the latter.

The pustular eruption of bromine and iodine may closely simulate *acne vulgaris*, smallpox, and syphilis. From *acne vulgaris* it may be distinguished by the absence of comedones, its development at periods of life and on regions of the body which would exclude ordinary *acne*. The acneiform eruption of iodine differs from smallpox in its more gradual development and decline. An element of confusion is occasionally introduced by the umbilicated character of the iodic lesions. Syphilis is usually distinguished by the history of the case and other concomitant symptoms. Nevertheless, many cases of iodide eruption, which have been treated for supposed syphilis, come under the observation of specialists. In the presence of any eruption which does not conform to the clinical type of an ordinary eruption the physician should always inquire what drug the patient has been taking.

A familiarity with the general characteristics of drug eruptions usually enables the physician to recognize the true etiological factor. In any case a comparatively brief expectancy will resolve all doubt. The prompt disappearance of a drug eruption upon cessation of action of the exciting cause constitutes a distinctive differential sign.

The offending drug may oftentimes be revealed by its presence in the physiological secretions—the urine, sweat, or saliva. The presence of turpentine and other essential oils in the urine may be detected by the sense of smell; the urine containing notable quantities of carbolic or pyrogallie acid is of a dark color, varying from brownish to nearly black. A series of valuable tests for the detection of drugs in the urine has been given in the author's work before cited.

Treatment.—In the treatment of drug dermatitis the indications are: 1, to suppress the exciting cause; 2, to promote the rapid elimination of the drug through the natural channels; and, 3, to relieve the existing inflammation by local applications of a soothing nature. In the majority of cases the fulfillment of the first indication is alone necessary. The tendency to spontaneous and prompt recovery upon the cessation of the use of the drug is an almost constant and invariable feature, the exceptions to which are the existence of certain diathetic conditions, and, in the severer forms, cachectic complications or general debility.

In certain cases when the patient's condition seems to require the continued use of the drug, as the bromides in epilepsy, the iodides in syphilis, or quinine in malaria, the irritating effect upon the skin may be counteracted or held in abeyance by a combination with certain other drugs, which act as corrigents, suppressing the cutaneous irritation without defeating the therapeutic object in view.

Arsenic, given in combination with bromide or iodide of potassium, is

said to prevent the acneform eruption. Belladonna, sulphide of calcium, and sulphaniline are also said to be effective for the purpose. Paget recommends aromatic spirits of ammonia. I am accustomed to employ atropia in $\frac{1}{100}$ -grain doses to counteract the irritating effect of the iodide upon the nasal and conjunctival mucous membranes. Tolerance of the iodide may often be secured by giving it in Vichy water, hot milk, or claret. Tincture of hyoseyamus and hydrobromic acid are both asserted to counteract the untoward effects of quinine. The use of dilute hydrochloric acid and other mineral acids, it is claimed, prevents the toxic effects of pyrogallol, chrysarobin, and other reducing agents by diminishing the alkalinity of the blood. When the iodides are given, the free use of the acetate of potash has been recommended with the view of charging the system with an excess of alkali, which may combine with any free iodine present.

The abundant use of alkaline diuretics and other medicines which stimulate the functional activity of the kidneys, thus increasing their capacity for rapid elimination, exert a marked modifying influence upon the tendency of many drugs to cause cutaneous irritation.

The local treatment will vary according to the intensity of the subjective sensations and the form and degree of the inflammatory phenomena. In many cases relief of the pruritic symptoms will be all that is required. For this purpose the use of the Turkish bath or hot baths, medicated with soda or salt, followed by the use of an inert dusting powder, will give relief. Sponging the surface with dilute aromatic vinegar, spraying with cocaine (one to two per cent), or an exceedingly dilute solution of menthol, carbolic acid, or other antipruritics, will prove beneficial. For the treatment of the dermatitis the measures recommended in other sections of this work for inflammation of the skin will be found efficacious. The severer forms of pustular and ulcerative lesions may be most effectively treated with bland ointments, carbolized vaseline, or dressings with powdered iodoform, dermatol, aristol, and remedies of this class.

DERMATITIS VENENATA. (PRINCE A. MORROW.)

In addition to the medicinal substances capable of causing inflammation of the skin by direct application, there are a vast number of agencies of vegetable, mineral, and animal origin which produce similar effects from accidental contact, from their use in the industrial arts, and from exposure to their irritative influence in other ways.

Numerous plants, growing wild or cultivated in gardens or conservatories, cause by their contact injury to the skin of varying degrees of intensity. Dr. White, in his monograph (*loc. cit.*), gives a list of no fewer than sixty native plants endowed with this noxious property. Workers

in flax and silk-weavers often suffer from dermatitis of an aggravated character. The use of certain chemicals and dyes in the manufacture of clothing, wall papers, and colored cloths, as well as the wearing of clothing impregnated with poisonous dyes, are common sources of dermatitis venenata. The *dermatitis anilina*, probably caused by the presence of arsenic in the aniline dyes, is usually of an eczematous character, and limited to the surfaces with which the dyed material comes in contact. I have frequently been consulted for an eczemaform eruption of the face occasioned by wearing mourning veils of *crêpe*. Leszinsky reports a case of severe dermatitis of the face following the use of a triple extract of heliotrope as a toilet preparation. The eruptive accidents following the use of powders and lotions for the complexion containing arsenic have already been alluded to in connection with the medicinal use of this drug. The use of soaps, especially the soft potash soaps, may occasion a localized dermatitis.

The handling of flour, sugar, and other grocers' articles enters largely into the etiology of the so-called "eczemas of occupation." Various irritants of animal origin; the poisonous secretions of many insects—mosquitos, fleas, hornets, wasps, bees; of numerous marine animals—as the jellyfish, sea urchins, etc.; the pathologically altered secretions of the human body—acid, decomposing, or diabetic urine, ichorous pus, acrid discharges from the nose, eyes, ears, and the other natural orifices, cause injury to the skin, with inflammatory phenomena.

Symptomatology.—The symptoms of dermatitis venenata are essentially the same as those described in connection with drug dermatitis. The form and intensity of the inflammatory reaction vary according to the nature of the irritant, the length of exposure to its influence, and the susceptibility of the skin.

Rhus poisoning may be taken as representing the most common and severe form of dermatitis venenata. The poisonous principle of rhus has been identified as toxicodendric acid. The irritating effect of any one of the several varieties of rhus—*rhus toxicodendron* (poison ivy), *rhus venenata* (poison sumach), and *rhus diversiloba* (poison oak)—upon the skin depends largely upon individual susceptibility. Many persons are entirely insusceptible to its toxic action, handling the plant with perfect impunity, while others are so sensitive that mere exposure to the volatile principle of the plant, without actual contact, is sufficient to excite the most violent dermatitis. Many cases are recorded exemplifying the extraordinary susceptibility to the poisonous emanations of rhus possessed by some persons—such, for example, as passing near the growing plant, sleeping in a room in which it had been hung, exposure to the smoke of burning wood to which the vine had clung, handling Chinese lacquer work, the varnishing of which is made from the *rhus vernix*.

The eruption of poison ivy is usually of an eczematous type, characterized by the appearance of numerous papules and vesicles upon an erythematous base. Not infrequently there are marked œdema and swelling, especially about the face. The vesicles spread from the starting point, which is usually the hands, along the wrists and upward on the arms, occasionally over the trunk, neck, face, and other parts of the body; the genital surfaces are almost invariably involved, from contact with the hands. The vesicles are ruptured by scratching or rubbing, exposing denuded surfaces, which become covered with thin crusts. Exceptionally the vesicles may become converted into bullæ or pustules. Intense itching is an invariable characteristic of the eruption.

Numerous cases of dermatitis have been observed in Japan and other Oriental countries from the handling of a variety of rhus—the *rhus vernix*—which is used in the preparation of a varnish for lacquered ware. Some persons are so susceptible that “they can not pass a varnish shop without being poisoned” (Allen, Jour. Cut. and Gen.-Urin. Dis., January, 1887). The hanging of embossed Japanese papers covered with the varnish may produce inflammation of the hands of the workmen.

Primula obconica, a common plant in conservatories, occasions in susceptible persons an inflammation of the skin; erythematous, papular, and vesicular eruptions of an eczematous type have been observed. In certain persons it occasions urticaria. The poison is supposed to reside in the hairs of the plant (Crocker). The oleander, the Virginia creeper, the vanilla plant, many garden plants—as the garden rue, balm of Gilead, nasturtium, etc.—are capable of exciting by contact with the skin dermatitis of varying types and degrees of severity. For a full account of the action of external irritants upon the skin, reference is made to Dr. White’s work (*loc. cit.*).

Diagnosis.—A dermatitis provoked by external irritants does not differ essentially in objective characters from that determined by an irritant circulating in the blood and brought in contact with the skin through its vascular channels. The important differential signs are its more sudden onset, as a rule, the limitation of the irritation to an area corresponding more or less closely to the site of application, its asymmetrical character, and the more typical forms of the lesions.

Treatment.—The treatment of dermatitis venenata is practically the same as that described under the local treatment of dermatitis medicamentosa. In the treatment of rhus poisoning alkaline lotions are indicated, with the object of neutralizing the toxicodendric acid. For this purpose soda baths, followed by applications of a solution of hyposulphite of sodium (3j to the ounce), or a saturated solution of bicarbonate of sodium, will be found serviceable. Continuous applications of the black wash give great relief. Painting the affected surface with

sweet spirits of niter is also recommended. Antipruritic ointments containing camphor, carbolic acid, with or without the addition of glycerite of cocaine, may be used when the more acute eruptive features have subsided.

DERMATITIS CALORICA. (ARTHUR VAN HARLINGEN AND E. J. STOUT.)

This term embraces two quite distinct and opposite conditions or subdivisions, according as to whether the inflammation arises from the action of an excess of heat, or from that of an excess of cold. To the former has been assigned the name of *dermatitis ambustionis*, and to the latter that of *dermatitis congelationis*.

DERMATITIS AMBUSTIONIS.

Definition.—This includes all those extremely common inflammatory conditions of the skin arising from the action of heat, whether dry or moist.

Varieties.—If dry, or from the action of the sun's rays, lightning, contact with fire or heated solids, and caustic agents, the resultant condition is known as a burn, varying in intensity from simple sunburn (*erythema solare*) up to a complete carbonization of a portion of the entire body, if moist, as from the action of steam, acids, or hot fluids (water, oil, molten solids), the injury is known as a scald. The extent of the injury in either case varies with the intensity of the heat and the duration of its application. The lesions that are produced may be erythematous (*dermatitis ambustionis erythematos*), vesicular or bullous (*dermatitis ambustionis bullosa*) or gangrenous (*dermatitis ambustionis gangrenosa*).

Symptoms.—No matter what the degree of injury may be, whether of the first or third degree, the patient's sufferings are always severe, and even extreme. Swelling, intense pain on motion and contact with the air or dressing, exfoliation of the epidermis, and suppuration are usually present. In burns of the first degree merely the swelling, pain, redness, and exfoliation are present, with but slight degree of shock, and only occasionally a trivial rise of temperature. The amount of shock increases with the degree of the burn, and in those of the second and third degree visceral congestion and inflammation contribute to the gravity of the patient's condition, frequently inducing a fatal termination. Ulceration of the bowel, cerebral effusion, pneumonia, pleurisy, and albuminuria may now be superimposed upon the severe local manifestations and cutaneous lesions; the wound sloughs, and is more or less fetid as long as the slough persists. Should the blood-vessels be involved in the destructive process, dangerous and exhausting hæmorrhages may occur from the

necrotic tissues, and profuse and exhausting suppuration will attend the process of separation. Finally, should the patient survive this appalling train of symptoms, cicatrization with its frightful consequences will ensue, and the unfortunate sufferer will re-enter into life maimed and crippled, and probably incapacitated for active business cares. One curious feature of these great burns that deserves mention is the remarkable tendency exhibited in many cases to an exuberant growth of granulation tissue, such a growth presenting to a large extent the proper process of healing by cicatrization and frequently necessitating a resort to dermatoplasty, or skin-grafting, in order to correct this riotous manifestation of Nature's workings.

Complications.—These may be briefly dismissed as being cerebral, intestinal, respiratory, and cicatricial. Congestion and even inflammation of the brain may very quickly follow a burn, the patient becoming at first restless and then delirious, often maniacal, and convulsive or comatose in fatal cases. Congestion of the mucosa of the gastro-intestinal tract is common, especially after severe burns of the abdomen; frequently this condition advances to ulceration of the duodenum (the so-called Curling's ulcer), which may result fatally from perforation and peritonitis. This ulceration of the bowel is most commonly seen in the young, and is accompanied by pain over the abdomen and in the epigastrium, vomiting of mucus and blood, diarrhoea with bloody stools, and in cases of perforation by collapse, with tympanitis, rapid peritonitis, and death. (Edema and inflammation of the larynx, bronchi, and lungs, with or without pleurisy, follow severe burns of the throat and chest, and so great may be the swelling of the fauces and laryngeal mucous membrane that tracheotomy must be resorted to to save the patient's life. Finally, in all burns of any gravity and extent, excessive cicatricial contraction ensues during and after the healing process, and unsightly deformities of the face and limbs result, fully worthy of the name of complication, and often requiring extensive and difficult plastic operations to correct. The scars are dense, puckered, and keloidlike, and, like all scar tissue, are essentially prone to undergo degenerative changes and to become the seat of epitheliomatous growths. In some rare cases the victims of severe burns may be carried off by an attack of septicæmia, by tetanus, by rapid and extensive erysipelatous development, or by the development of amyloid changes in the organs consequent upon the prolonged and free suppuration.

Pathology.—After a burn the circulation in the part generally becomes slower, and the smaller blood-vessels become contracted, thus preventing the proper entrance of the blood-corpuscles into them, while the larger vessels, not so profoundly affected, become distended with blood. The corpuscular elements of the blood undergo changes in form, and

their vital properties become impaired. These alterations in the corpuscles, together with the changes in the caliber of the vessels, give rise to the formation of thrombi, with consequent occlusion of the vessels and stasis of the blood current in various portions of the body. The pulmonary artery is most apt to become the seat of such a thrombus, and there follows a general stasis in the veins from the resistance offered to the blood entering the right ventricle. On this principle of thrombosis and stasis may be explained the production of the congestion of the various internal organs that play such an important rôle in the prognosis and secondary manifestations of the case.

Diagnosis.—As a rule, the question seldom arises as to whether a certain injury is a scald or a burn, the history of the case being circumstantial. It has been suggested, however, that burns, in addition to the characteristic odor of burning flesh that always accompanies them, destroy the hirsute growth as well as injure the cutis itself; while scalds, though they may be severe, frequently do not injure the hairy covering of the skin. Such a diagnostic point may be of value in disputed cases, although, whatever may be the origin of the burn, in either case the treatment is substantially the same. A much more important consideration is the classification of burns, which is determined according to the extent of tissue involved. Adopting Morton's classification, which is probably more simple than the well-known classification of Dupuytren, burns may be grouped under three headings, as follows: 1. Those of the first degree, characterized by a simple reddening of the surface, varying from an erythema to inflammation without vesication. 2. Those of the second degree, including all marked by inflammation with vesication (vesicles and bullæ). 3. Those of the third degree, in which there is extensive destruction of the skin itself with the subcutaneous tissues, resulting in carbonization or gangrene, with scar formation.

Prognosis.—The prognosis of a burn or scald will vary according to the following factors: 1. The strength of the patient. 2. The age. 3. The severity of the injury. 4. The extent. 5. The location. Much will depend upon the ability of the patient to resist the shock entailed upon his system; thus, while a burn of but comparatively slight extent and depth may result fatally in one individual of delicate organization and feeble constitution, one of much greater severity may be recovered from by another not so finely constituted. The temperament of the patient is also intimately connected with the result, and will indirectly aid materially in throwing off the effects of a burn, or in directing the injury to a fatal termination. Either extreme of age adds essentially to the gravity of a burn, and a comparatively trivial injury of this kind may very readily produce fatal results in both children and the aged. The undeveloped or enfeebled system is unable to resist the shock, death rapidly

ensuing from the cause in the vast majority of cases. Two very important considerations in the deduction of a prognosis are the severity and extent of a burn. As a rule, it may be set down that burns of the first and second degree are quickly recovered from, but that when the deeper tissues are invaded, especially when the superficial area involved is extensive, the prognosis becomes graver *pari passu* with the depth and extent of the injury. The question of surface involvement is more serious than that of depth, and a burn of the first degree, even if covering a considerable portion of the body, may result more disastrously than one of the second or third degree of but limited extent. It is generally conceded that a burn involving from one third to one half of the free surface of the body will result fatally in from twenty-four to forty-eight hours, death following from suppression of the functions of the skin. As regards the situation of a burn, the greatest gravity will be associated with those involving the abdomen and chest, the danger lessening as the neck, head, or limbs are the portions injured.

Treatment.—This is local and general, and includes the control of pain, the correction of shock, the prevention of internal congestions, and early and late stimulation to overcome the tendency to exhaustion. An opiate administered hypodermatically at once will tend to quiet the patient and will be very gratifying in arresting the pain. This should be repeated as required, and should be followed by alcoholic stimulation. As to the immediate dressing of the wound, much relief may be given by painting over the burned surfaces with a five to fifteen per cent solution of hydrochlorate of cocaine, following this by a protective dressing, and this process repeated as often as the symptoms shall require. The old and reliable “carron oil,” ointments of vaseline and boric acid, solutions of bichloride of mercury (1 to 1,000), or borated lint, carbolized vaseline or sweet oil, carbolized pastes of flour, starch, or white lead, ointment of benzoated oxide of zinc, iodoformized ointments, or eucalyptus ointment, followed by a dressing of lint or antiseptic cotton, will add materially to the patient’s comfort. In applying these remedies it should be borne in mind that only a small portion of the burn—if it be extensive—should be treated at a time, in order to avoid chilling; vesicles and blebs should not be broken, if it be possible to avoid doing so, and only when required should they be drained by puncture at their most dependent portions, the skin being permitted to rest upon the surface beneath, thus serving as a protection from the air. A favorite household dressing for burns is the powdered bicarbonate of soda which is claimed to relieve the pain almost instantly. The burn is covered with it and then bound with moist lint or muslin. The application of cold cloths dipped in ice water, or wrung out in antiseptic and soothing solutions, such as Condly’s fluid, carbolized water, or fluid extract of hamamelis, may be employed, care being ob-

served not to chill the patient. They should not be used, or at least only with great care, in cases of extensive burns. The dressing, whatever it may be, should not be changed frequently, and only when the discharge is excessive or the odor marked. In grave burns of the second and third degree amputation may be required, and this should be performed at the proper time, after carefully noting the extent of the slough, in order to avoid the danger of secondary hæmorrhage or the opening of a joint by repeated after-sloughing, and a secondary amputation. Exuberant granulations require astringent and caustic applications, as silver-nitrate stick, copper sulphate, or lead salts. Skin-grafting will hasten the healing of extensive raw surfaces, and contraction and deformity may be largely prevented by the judicious employment of splints and extension. The constitutional treatment will include absolute rest, a simple nourishing diet, the arrest of thirst, which is usually intense, by fragments of ice or sips of carbonic-acid water, judicious stimulation, the use of gentle laxatives, preferably by enema, to counteract the tendency to constipation, or of astringents for the diarrhœa that may result from intestinal congestion or ulceration.

DERMATITIS CONGELATIONIS.

Synonyms: Frostbite; Chilblain; Chilbladder; Pernio; Erythema Pernio.

Definition.—This condition has been defined as “a painful inflammatory condition of the skin of the finger, toes, heel, or other portions of the foot, hand, or limbs, caused by exposure to cold, and attended with tenderness, vesication, and sometimes by sloughing, ulceration, or gangrene.” It is another very frequently encountered disease, and in the form of the so-called chilblain is especially prone to occur in those whose circulation is poor and constitution feeble. Thus, children and old people are very frequently sufferers from this complaint, it often recurring in them in successive winters.

Varieties.—As in the case of dermatitis ambustionis, it is convenient to divide this second division of dermatitis calorica into three classes, as follows: 1, those of the first degree, characterized by simple redness of the skin; 2, those of the second degree, characterized by vesication (vesicles or blebs); 3, those of the third degree, characterized by gangrene and destruction of tissue, with scar formation and mutilation.

Symptoms.—When an extremity or part of the body is the seat of a minor degree of frostbite, it presents a characteristic appearance; it becomes white, the skin assumes the washerwoman appearance, dead and wrinkled, and, if the cold be continued, there is diminished or total loss of sensation. Upon removal of the cold, the part quickly becomes red, often intensely so, swelling occurs, and pain, pricking and itching in character, are experienced, gradually passing away as warmth is applied. Let

the cold be continued longer, however, and the part enters into the second degree of frostbite. In other words, vesication occurs, the serum contained in the blebs usually being sanguineous in nature. This is always a serious condition, and is very prone to develop into the third stage, or that of complete death of the part, with mortification. Limbs that are so frozen are claimed to be brittle, even as much so as glass, so that rough handling will cause separation of their parts. Upon removal of the cold the affected portion gradually swells, changes in color, and is separated by a process of ulceration after the formation of a line of demarcation. This change frequently will not take place for twenty-four or forty-eight hours, after which time the gangrenous process proceeds in the usual manner, and with the usual manifestations of pain, odor, and disorganization.

The so-called chilblain is a frequent manifestation of the action of cold upon the hands and feet of poorly nourished individuals. Especially are the borders of the extremities affected, the process beginning as an erythema, with burning and itching, followed frequently by vesication and ulceration.

Diagnosis.—The condition is one of such evident characteristics that no possible source of error can be discovered.

Prognosis.—Frostbite of the lighter grade is never serious if properly treated. However, a part once the seat of a frostbite is more or less prone to have a recurrence of the manifestations in each succeeding spell of cold weather, and thus may become a constant source of suffering to those so afflicted. When the condition has advanced to the severer grades the question of prognosis becomes more complicated. Mutilation is very apt to follow, and frequently death from shock consequent upon the condition, or secondary to operation for removal of gangrenous tissue, is not uncommon. The prognosis in all such cases must, therefore, be guarded both as regards deformity and danger to life.

Treatment.—This is a very essential matter, much depending upon the proper management of the condition. Above all considerations should the rapid application of heat to the benumbed member be avoided; the patient should be placed in a cold room far removed from a fire, and gentle friction of the surface with snow or ice water should be made. Then, as the circulation increases in force, the temperature of the room should be slowly raised, and slight stimulation, mainly with hot coffee or tea, should be administered. At the same time the affected limb should be bathed in cold lotions and maintained at a low temperature. Should vesication be present, the blebs should be opened and the limb left with cool applications, until it be seen whether or not gangrene is about to occur. Should the latter take place, amputation remains as the *dernier ressort*, and it must be done before the patient's condition becomes precarious. The after-treatment of a frost-bitten limb consists in hygienic

measures altogether. Extra precautions must be taken to prevent a recurrence of the trouble in succeeding exposures to cold ; warm flannel and cotton hose and gloves, with other protection against the inroads of the weather, must be depended upon, and efforts should be made to stimulate the circulation and improve the general condition of the body.

DERMATITIS TRAUMATICA.

This name includes the inflammatory cutaneous changes due to violence, and to mechanical irritation of the skin, and embraces abrasions, excoriations, and contusions produced by scratching or friction from badly fitting garments, pressure, etc. When the skin has been subjected to long-continued irritation, pigmentation, decidedly marked, and an indurated condition of the skin, are apt to follow. Soothing applications and removal of the exciting cause are all that is required in the way of treatment.

FEIGNED SKIN DISEASES. (ARTHUR VAN HARLINGEN AND E. J. STOUT.)

Synonym : Dermatitis Artificialis.

Feigned or simulated affections of the skin are met with among two entirely different classes of patients.

Soldiers, sailors, and prisoners are often induced, by the hope of avoiding duty or escaping punishment, to simulate sickness of various kinds ; and, in civil life, mendicants and others, desirous of soliciting alms or of obtaining the temporary shelter of charitable institutions, not infrequently feign some affection which is considered likely to attract sympathy or to demand succor.

Skin diseases are most commonly simulated, because such affections can easily be imitated without continuous effort ; and, in Europe especially, these simulations are so frequent that they have been catalogued and classified (see Lavgier, Dict. de Méd. et de Chir. Pratiques, article *Maladies simulées*).

Sycosis has been imitated, with greater or less success, by means of applications of tartar-emetic ointment, which produces umbilicated pustules followed by thick crusts. Oil of cade or tar produces a somewhat similar eruption. Sequestration of the patient beyond the reach of irritating substances is followed by a rapid cure. Even close observation of individual lesions for a few days will show the presence of the artificial eruption, as the lesions run a rapid course, while those of *sycosis* are much more persistent.

Favus is imitated by dropping nitric acid on circumscribed areas of

the scalp, protecting the neighboring parts by a circle of grease or ointment. This produces lesions resembling the yellow cups of favus, but to be distinguished certainly by microscopic examination, which in the case of favus infallibly shows the presence of fungus. Favus is such a rare disease in this country that it is not likely to be simulated often. As its presence permits French conscripts to avoid service in the army, simulation of favus is said to have been formerly not uncommon in that country.

Alopecia areata may be simulated by plucking out the hairs over a circumscribed area, but a close examination will show traces of this rather violent operation; and surveillance, even for a few days, will permit the growth of new hairs to be perceived by the eye before they grow long enough for a fresh epilation.

Tinea tonsurans is simulated by the partial destruction of the hair by means of depilatories. These, however, give rise to an irritation of the skin quite different from the peculiar ash-colored, goose-fleshlike surface to be seen in tinea tonsurans. Microscopic examination of the short hairs will, as in the case of supposed favus, show the character of the disease.

Scabies may be simulated by careful tearing up of small portions of skin by the aid of a fine needle. The absence of the peculiar and characteristic burrow of the itch insect, and the impossibility of demonstrating the presence of the acarus, make it an easy matter to detect a fraud of this kind.

Bromidrosis.—It is said that in France malingering conscripts simulate bromidrosis by anointing the axillæ with Dippel's animal oil, grease impregnated with asafoetida, decayed fish, or cheese. Frauds of this sort are easily detected if the suspected person is thoroughly cleansed and kept under surveillance for a short time. Carbonate of sodium and permanganate of potassium can be used for disinfection. An additional means of detection is the examination of the soles, which in true bromidrosis present a macerated appearance. After thorough cleansing, if the supposed malingerer is caused to sweat violently, the perspiration freshly secreted will show whether or not true bromidrosis is present.

Hæmatidrosis is sometimes simulated, but not, so far as we know, by malingerers. This form of feigned skin disease will be described later. Careful surveillance with examination, to make sure that the blood of some animal has not been substituted or some minute punctures practiced, will usually make the diagnosis plain (Mattei, *Maladies simulées; Hæmorrhagies spontanées par les Doigts, Erysipelas, etc.*, Rev. Méd., 1850, viii, p. 370).

Chromidrosis has frequently been simulated, and, in fact, the existence of some forms of genuine chromidrosis was denied for a considerable time. Black chromidrosis in particular was held in great suspicion. But

the careful examinations of several experts, particularly in France, have placed the existence of genuine black beyond question. Plumbago, soot, indigo, pure or mixed with tale, have been employed to imitate the peculiar blue-black of some varieties of chromidrosis. To discover a fraud, the part should be carefully washed, examined with a lens, and kept under careful observation, or covered and sealed. Microscopic examination of the substance appearing on the surface will sometimes throw light on the materials composing it, and thus lead to a discovery of the genuineness or falsity of the supposed chromidrosis. Black chromidrosis is the only form which has been simulated (Mackintosh, *Attempted Simulation of Disease, Black Spots, etc.*, Canada Med. Jour., 1870, vi, p. 529).

Vesicular and pustular eruptions may be either simulated by causing an inflammatory condition of the skin *de novo*, or a feigned increase or persistence of a disease already present may be practiced.

1. *Irritated Eruptions*.—Croton oil and other irritants are used by malingering soldiers and others to produce pustular eruptions, and sulphur, turpentine, pitch plasters, mercurial ointments, etc., are also employed for the same purpose. The application of all these substances with the intention to produce irritation is followed by an eruption of confluent vesicles which become rapidly purulent or of vesico-pustules covered with a thick crust.

2. *Sustained or Aggravated Vesicular or Pustular Eruptions*.—The diagnosis in these cases must be made, not as to the nature of the eruption, originally a spontaneous one, but as to the cause of its persistence. Such cases not infrequently occur in large hospitals, where the soothing applications made during the day by the physician are replaced at night by irritants. Hermetic occlusion of the affected spot or localities, with surveillance will unmask the fraud.

Rupial eruptions are said to have been produced by ingenious French malingerers, but as eruptions of this nature are apt to be accompanied by cachexia and other signs of a depraved condition of the system, it would probably not be difficult to distinguish the true or false character of the eruption.

Ulcers have been factitiously produced for purposes of deception by malingerers and deceivers in all ages. Various animal, vegetable, and mineral substances have been employed to cause such a destruction of tissue as shall simulate a true ulcer—oil of cashew nut, *cantharides*, the *clematis vitalba* or common virgin's bower (a former remedy for scabies), the *ranunculus sceleratus* (a species of crowfoot), the *anemone pulsatilla*, the *euphorbia lathyris*, *bryony root*, *savin*, *nitric acid*, *potassa caustica*, and frequently *caustic lime*. This list is given to aid the diagnosis in doubtful cases, but commonly there are certain features of the factitious ulcer which will serve to distinguish it from other affections with which

it is liable to be confounded—thus, the appearance of the sore and its surrounding parts, the condition of the patient, and the probability, or not, of any advantage to be gained by simulation. In the lower limbs the presence or absence of varices, dermatitis, eczema, previous gummatus swellings, etc., should all be taken into account (see also the description in other parts of this work of diseases apt to give rise to ulceration—e. g., *cancer*, *epithelioma*, *scorbutus*, *scrofula*, *syphiloderma*, *ulcers*, *dermatitis medicamentosa*, etc.). In the case of genuine ulcers, kept open by stimulation or irritation, hermetically sealing the part with surveillance may be required to demonstrate fraud (see Simulation of Venereal Ulcers, Dublin Hospital Gazette, 1859, N. S., vi, p. 24).

Erysipelas is occasionally simulated by the application of irritants. *Thapsia* is employed for this purpose in Europe. The artificial dermatitis thus produced does not, except to the most superficial view, resemble erysipelas; there is little or no fever—no general symptoms of any kind, in fact—and the affected surface commonly shows minute phlyctenulae or numerous minute vesicles (cf. Matei, *ut sup.*).

Phlegmon, or *abscess*, is occasionally produced by excessive stimulation of the surface, or by the introduction of foreign objects under the skin. The malingerer or simulator must, in these cases, not only possess unusual fortitude to induce painful lesions of this sort, but must also be sufficiently alive to the pathological necessities of the case to put his sticks and thorns (or what not) in places where such objects would be apt to become imbedded. Such simulations are not without danger to the patient. Hutchinson gives a case in which amputation had to be performed as a result.

Leprosy has been simulated. In the St. Louis Medical and Surgical Journal for October, 1889, the case is mentioned of a Swede admitted to the Cook County Hospital of Chicago with an affection, asserted to be leprosy, which the patient maintained to have been contracted in Sweden. Careful investigation developed the fact that it was a case of simulation. The symptoms were not mentioned in the report, but the fact that such simulation has been practiced should be kept in mind.

The second class of patients in which feigned eruptions are encountered are those suffering from that peculiar form of mental and nervous derangement known as hysteria. These are chiefly, if not almost altogether, of the female sex.

Among the multiform and complex manifestations of the hysterical condition, simulations of various affections of an entirely different character are not uncommon, and cases of feigned hysterical skin affections are not unfrequently met with. Some of these are caused by the patient with the object of exciting sympathy; others, in all probability, by mechanical efforts to relieve abnormal nervous sensations; others, again,

without any assignable motive, while a certain number of cases of skin disease occurring in hysterical persons, and hitherto considered as simulated, may possibly not belong in any sense to the class under consideration, but may be caused as a direct result of the influence of the nerves upon the nutrition of the skin.

Among the more common of the feigned hysterical skin affections are those of an inflammatory character. Stelwagon has described the case of a girl of nineteen, pale, nervous, and suffering from hysterical aphonia, who applied for relief for an eruption which had persisted almost uninterruptedly for three months, and which consisted in groups of two or more parallel, elongated, crusted lesions situated on the flexor and extensor surfaces of the forearms and on the tibial surfaces of the legs, with eczemaform patches in the flexor of one elbow and on one instep. The crusts resembled those of *impetigo contagiosa*. The patient, who had been for some time unsuccessfully treated, was finally suspected of simulation, and, on being closely questioned, confessed having produced the lesions by constant rubbing with the finger ends. The sensation thus aroused was an agreeable one, and it was this, she asserted, and not the desire to gain sympathy, which was her object.

Fortner has described the case of an unmarried woman, twenty-five years of age, who applied for the relief of a supposed loss of power in the thumb, probably hysterical. Shortly after coming under observation certain peculiar lesions showed themselves on the skin of the back of the right hand and wrist, consisting of four oval abrasions three quarters of an inch in length by one quarter broad, and presenting the appearance of a blister from which the cuticle has been removed, leaving a raw surface bathed in serum. Zinc-oxide ointment was applied and the wrist securely strapped and bandaged, when the sores quickly healed. New ones appearing a little later, Fortner, suspecting the artificial character of the lesions, took occasion to rub a stick of lunar caustic over each abrasion until considerable pain resulted. This acted as a deterrent, and no more sores appeared. Seven months later, however, the patient returned with the same lesions. She belonged to a markedly neurotic family, and Fortner very properly reached the conclusion that the lesions had been artificially produced, probably to create sympathy.

A similar case has been reported by Murrell. A young girl of fourteen showed certain lesions which had appeared on and off for a year previously, breaking out immediately after the occurrence of nervous phenomena called "fits." According to the history given, the arms and legs alone had been affected, the eruption coming on in the night, and the lesions presenting, when examined, the appearance of blisters or burns, and taking a long time to heal. Subsequently "bladdery heads" formed, full of water, and these burst, leaving sores. On examination, several

elongated patches like recently healed blisters, one and a half inch long by half an inch broad, could be seen on the arms and legs and under the mammary region. Although when taxed by the examining physician the patient persistently denied having produced the lesions upon herself, yet there seemed no doubt that the lesions were artificial and self-made.

We have observed a number of similar cases occurring in young women, where, however, no clew could be gained as to the cause of the eruption. In one case, erythematous patches of irregular shape, soon changing to slight exudation and crusting, or occasionally to denudation of the skin, occurred on the face, backs of the hands, forearms, and occasionally the legs. The eruption seemed to be a dermatitis. It was accompanied, at first, by a burning sensation, but gave no trouble afterward. It appeared to be a source of great shame and annoyance to the patient. Although it was suspected of being factitious, no proof of this could be obtained.

Under the name of so called "erythema gangrenosum," Dr. T. C. Fox has described two cases, in one of which large, rounded, or oval patches of gangrenous inflammation of the skin of the neck and arms appeared successively or at intervals for several years, leaving in some cases faint scars, in a hysterical woman of forty-five, while in the other case, a girl of seventeen, there existed erythematous areas of a severe type, like scalds, running into vesiculation and drying up without scars. The localities affected in the latter case were the mammæ, forearms, thighs, and legs.

A comparison of cases like the above cited will show a general similarity in the character and locality of the lesions. The slighter cases may most frequently be produced by simple friction, while the application of caustic substances may have produced the gangrenous patches. The following cases belong to the latter category :

Bazin has reported a case in which a young girl succeeded in producing an eruption of bullæ by introducing cantharides powder under the epidermis. A case was reported by the late Dr. Fagge, of London, in which a young girl caused an eruption of bullæ resembling those of pemphigus, by the application of nitric acid to the skin. A careful study of the course pursued by the eruption, together with an examination of the buccal and pharyngeal mucous membrane, and a consideration of the patient's general health, will throw light on the character of the eruption.

Bondet (Soc. Nat. de Méd. de Lyon, December 19, 1892, *Sajous Ann. Univ. Med. Sci.*, 1894) reports the case of a girl of seventeen, suffering from hysterical chorea, in whom successive outbreaks of bullous lesions occurred on the dorsal surface of the hands and forearms, and on the forehead and cheeks. The lesions appeared as sharply defined red patches slightly raised above the surface, which quickly became covered with a number of vesicles, at first distinct and later running together to form

bullæ, like those of a blister or of pemphigus. Later these lesions dried up into yellowish or brownish crusts, which finally desquamated, and at the end of eight days the skin had recovered its normal aspect.

The name of *pemphigus hystericus* has been given to these eruptions. It is not certain whether some of them may not be neurotic eruptions, and due to the direct action of the nervous system rather than the effect of external and artificial irritation.

One of the most curious and at times most inexplicable of the skin affections connected with the hysterical condition is *hæmatidrosis*, or hæmorrhage from the skin.

Strictly speaking, hæmatidrosis is a hæmorrhage from the unbroken skin through the sweat glands. This occasionally occurs in hysterical persons, but it is a condition which, so far as we know, can not possibly be simulated by artificial means. In these cases the lesion begins as an erythematous patch or thin scale, which is later elevated by the effusion of bloody serum or of pure blood beneath. At other times a miliaria-like, vesicular eruption precedes the diapedesis.

Some of the most interesting of these cases have been reported under the name of *stigmata*, being the appearance of effusions of blood under the skin, in the palms, dorsum of the feet and legs, side of the thorax, etc., in imitation of the wounds of the crucifixion of Jesus Christ. Occasionally these have been ascertained to be simply cases of hysterical simulation; in other instances there seems every reason to believe that the effusion has been, in part, the result of fixed attention directed to the locality, aided by more or less unconscious manual or other irritation; and in some cases it is not impossible that the effusion has been the direct effect of the action of the nervous system (Parrot, *Étude sur le Sueur, du Sang et les Hémorrhagies Neuropathiques*, Gaz. Hebdom., 1859, p. 633 *et seq.* See also the case of Louise Lateau).

Diagnosis.—Feigned diseases of the skin are often very difficult of diagnosis. Some suggestions regarding the diagnosis of the feigned eruptions of malingerers have been given above, but a few general remarks may be added in conclusion.

When any eruption appears, either from its anomalous aspect or locality or on account of any mystery attending its outbreak, to present difficulties in the way of classification under the head of the ordinary and well-known diseases which it most closely resembles, suspicion may at once be aroused as to its possible artificial nature.

The patient's character and circumstances and the possible inducements to simulation should be inquired into; and, especially in the case of young females, any neurotic taint or any sign of previous or concomitant nervous disorder, particularly of a hysterical nature, should be noted.

Two points must be remembered regarding the eruption itself. First,

if factitious, it is almost always anomalous in the time, place, or manner of its appearance, and in the course it runs. Second, it is likely to show some sign of having been artificially produced, and is almost invariably in a position easily and conveniently accessible to manipulation. Thus, the face, forearms, chest, and mammary region, and after these the lower limbs, are most apt to be the seat of the eruption. If, in addition, any motive for malingering or for exciting interest or sympathy can suggest itself, the case should be carefully looked into from this point of view. The lesions and their neighborhood should be examined with a view to detecting any trace of the use of mechanical irritants, or of such domestic articles as are apt to be used—mustard, vinegar, cantharides, nitric acid, etc., have all been employed at one time or another. The examination should always be conducted in such a way as to avoid arousing suspicion on the part of the patient or the patient's friends; and if the physician comes to a positive conclusion that the eruption in any given case has been artificially produced, let him not think of proclaiming his conclusion, which will probably only lead to the suspicion, on the part of friends and relatives, that he is ignorant of the true nature of the disease. It is better to treat such cases, especially in hysterical persons, with placebos, and have them recover spontaneously, without forcing the patient to admit a deception, or pitting one's reputation for sagacity against the patient's veracity.

SPHACELODERMA. (GEORGE T. ELLIOT.)

Synonym: Gangrene.

In treating of gangrene, only those forms which come more particularly under the notice of dermatologists will be included here. Those others which are the result of injuries, and of other conditions, and which belong entirely in the domain of surgery, are omitted, and for their description reference should be made to treatises on that branch of medicine. Only dermatitis gangrænosa infantum, symmetrical, diabetic, and multiple gangrene will be considered in this connection.

DERMATITIS GANGRÆNOSA INFANTUM.

Synonyms: Varicella Gangrænosa; Ecthyma Térébrant; Pemphigus Gangrænosus, etc.; Multiple Cachectic Gangrene (Simon).

This rare disease of the skin, when described by Hutchinson, was regarded as a complication and sequel of varicella, and he gave to it the name of *varicella gangrænosa*. It was seen later, however, in connection with vaccination, and Crocker, having noted its occurrence independently of either of these affections, applied to the eruption the much more ac-

ceptable term of *dermatitis gangrænosa infantum*. Bazin regarded the process as a pemphigus, and it has been called by the French *ecthyma infantile gangréneux*, *ecthyma térébrant*, etc. I believe it to be the same disease as was described by O. Simon as multiple cachectic gangrene. Cases have also been reported by Barlow, Payne, Stokes, myself, and others.

Definition.—I would define it as an inflammatory disease of the skin, probably due to infection by micro-organisms. It is characterized by the formation of vesicular and pustular lesions, which result in gangrenous destruction of the cutaneous tissues.

Symptomatology.—The manifestations of the disease are located usually upon the buttocks, on the inner and the posterior aspects of the thighs, and in the inguinal regions; but they may also occur on the back and other portions of the body. Crocker states that when the eruption develops during the existence of a varicella, the lesions are distributed especially over the head and upper half of the body; but if the varicella is almost gone, it occupies the lower half. When it develops in connection with vaccinia, the disease begins on the same arm, but not at the site of the vaccination. In all my cases, which developed independently of any previous disease or cutaneous eruption, the lesions occupied entirely the lower half of the body.

The process begins as an erythematous spot, upon which a small vesicle, or a vesico-pustule, or a pustule, rapidly develops and increases in size, being surrounded by a red or perhaps livid zone. If it is a vesicle, the contents quickly become purulent. In some, umbilication occurs. The lesion having become as large as a pea, or even before reaching that size, ruptures and a crust is formed. Its growth, however, does not then cease, and the lesion may become a half inch and even more in diameter. It is then represented by an adherent, somewhat depressed crust, surrounded by an elevated and indurated red border. The crust begins to separate in a short time, and after its removal extension generally ceases, but not always. The destruction of tissue is sometimes superficial, but more often through the entire cutis, and even the subcutaneous connective tissue, the cavity produced being filled with a grayish, necrotic mass, saturated with an ichorous fluid, or with thick, purulent matter. The base of the ulcer bleeds easily, and its sides are precipitate, while it is oval or round in outline. Owing to a number of lesions occurring near to each other, they may coalesce by enlarging, and a large, irregular-shaped ulceration result. After the crust has been removed, the lesions remain stationary for a while and then heal up rapidly, leaving depressed cicatrices.

There is no limit to the number of efflorescences, which may develop. They may be only a few, or the surface may be thickly covered with them. When the eruption is severe, there may be considerable somatic

disturbance, fever, and general constitutional symptoms. Secondly, and as a result of purulent absorption, septicæmia and pyæmia may develop, or complications of various kinds may arise and a fatal result be experienced. These will, however, occur in extreme cases, or in debilitated subjects, or from neglect, etc.

Etiology.—The disease would seem to be limited to very young children, all the cases recorded being under three years. My own cases were all under two years of age. The female sex appears to be especially liable, as the majority of those affected were girls (Crocker). Hutchinson described it as a sequel of varicella and of vaccinia; but there are so many cases which develop independently of either of these diseases, that it is preferable to regard the association of the one with the other as a coincidence, or to look upon the former and general diseases as predisposing factors only, in the same way as other eruptive and pustular processes may be. Crocker saw cases, for instance, originate after lichen planus infantum and on miliaria rubra pustules. In my own cases, there had not been any preceding varicella, vaccinia, or other eruptive disease, but the patients were anæmic and debilitated, had had and still had intestinal disorders and diarrhœa, and the lesions, being limited to the surfaces, which had been covered by the soiled napkins, suggested that the causal agent may have been in the bowel discharges. Tuberculosis is mentioned as a frequent etiological factor, and Crocker speaks of congenital syphilis and rickets; but the process also develops upon patients apparently perfectly healthy.

Pathology.—It is more than probable that the disease is due to infection by micro-organisms, but a constant germ has not been found in connection with the lesions. Ehlers discovered the bacillus pyocyaneus in two cases; Kallinger the staphylococcus cereus albus in the secretion from the ulceration; and others have found various diplococci, staphylococci, and streptococci.

Diagnosis.—The location, mode of evolution of the lesions, and their transformation into gangrenous ulcers sufficiently characterize the disease to prevent errors in diagnosis. All the lesions do not appear in one outbreak, but, cropping out successively, allow all stages of the process to be present on the surface at the same time.

Prognosis.—This is said to be serious in the very young and when the extent of surface attacked is great; also when tuberculosis is present. Of course, if other complications arise, as septicæmia, pyæmia, etc., the prognosis will be unfavorable, and fatal results occur. I doubt, however, that in itself the disease is fatal; but it is so only in virtue of the secondary complications which may occur.

Treatment.—*Internally*, the child should receive, in the first place, proper and abundant nourishment, tonic treatment, and all means should

be made use of to remove any dyscrasia or malnutritive conditions. If indicated, phenacetine, quinine, etc., may be given to reduce the temperature, and, according to the systemic symptoms presented, other remedies should be administered. Crocker recommends salicylate of soda, and says that Coutts got good results in one case with opium. If complications arise, they should receive suitable treatment.

Locally, I would sum up the treatment in the word *antiseptic*. Any of the drugs which come in that category may be used. Crocker mentions iodoform and iodol in vaseline. Chlorinated lime on lint is also recommended. I would advise separation and removal of the crusts and sloughs, opening all the recent pustules or vesicles, and thorough disinfection with bichloride of mercury solutions (1 to 1,000, or weaker), and then dressing with a five-per-cent ichthyol ointment, or one of plumbum lactas (three to five per cent). In my cases thorough protection, by means of impermeable dressing, of the affected surfaces from the bowel discharges, and ichthyol in addition, led to rapid cessation and cure of the disease.

MULTIPLE GANGRENE IN ADULTS.

Under this designation, any case of multiple gangrene of whatever nature or causation might properly be included, and the term is in reality a collective one. Still, attempts are made to limit it to cases which, developing spontaneously, are neither examples of symmetrical nor of diabetic gangrene. It has been seen most usually in young females, subjects of hysteria, the gangrenous areas appearing from time to time and the process running a long course. Herpes zoster gangrænosus probably belongs here, and Crocker mentions a case originating after scarlatina, and one associated with some suppurative lesion of the vagina.

SYMMETRICAL GANGRENE.

Synonym : Raynaud's disease.

Particular notice of this form of gangrene was taken only after Raynaud's description of it in 1862, although it had been previously known and observed. Since his publication, however, the literature of the subject has increased, many cases have been recorded, its etiology has been to some extent cleared up, and the narrow limits originally given to it have become considerably extended.

Definition.—A nutritive disturbance affecting the skin, generally but not always symmetrical, and represented by localized ischæmia and asphyxia, which result in the production of gangrene.

Symptomatology.—The locations of the ischæmia and asphyxia, which usually precede the development of the gangrene, are most usually on the ends of the fingers and toes, on the ears, the nose, the cheeks, and

any part of the upper extremities, but it seldom occurs on the trunk, the palms, and other portions of the body. In the majority of cases, the disturbances occur in a symmetrical manner, but they may also be unilateral and in some instances they may appear on one side of the body and then on the other.

Local Syncope or Anæmia.—Prodromal symptoms often usher in the attack, such as slight or severe pain, numbness, and a sensation of discomfort. The temperature of the affected area is lowered, it becomes pale, waxy, and cadaverous in aspect, and if pricked or cut no blood flows. These symptoms persist for a variable period of time, when the normal conditions may be re-established and the pain ceases. The attacks may be repeated at shorter or longer intervals, the part returning to health again, or the further stage of local asphyxia may develop.

Local Asphyxia.—The conditions representing local asphyxia may follow upon the local ischæmia, or it may appear immediately and be primary. It is characterized by a sharply defined or diffuse deep-red area, which quickly becomes of a lead or blue and finally black color. There is some swelling from œdema, the surface temperature is lowered, and a sensation of cold and numbness is experienced. Sometimes there is extravasation of blood into the tissues. In the same manner as local syncope, the asphyxia may disappear without leaving any trace except the extravasated blood. There may be only one attack, or it may return from time to time on the same or on other areas, the circulation becoming each time restored. If the fingers and toes are the affected portions, they gradually show nutritive disturbances, they become thinned, atrophic, and pointed, or somewhat thickened and blunt. Gangrene generally results after repeated attacks, though not with the first one.

Gangrene.—The development of the gangrenous symptoms may be sudden, or have been preceded by prodromal symptoms, in addition to those of local syncope and asphyxia. These symptoms may be due, however, to the basic disease producing the gangrene and will necessarily vary. Still, headache, anorexia, diarrhœa, and weakness have been observed, and sometimes a continuous elevation of temperature. Fainting fits, amblyopia, and intermittent albuminuria have also been known to occur. Locally, there may be lancinating, neuralgic pains, a sensation of cold, pricking, sometimes anæsthesia and analgesia. Frequently, there have been outbreaks of diffuse erythema over the body, or of circumscribed red macules over certain nerve regions, or of vesicles accompanied by itching and burning.

The implicated areas may remain pale, cold, anæsthetic, or hyperæsthetic for a length of time, and then the symptoms of local asphyxia appear symmetrically or not, and at the end of a few day the gangrene develops. The black color originates quite rapidly. The gangrenous

area is sharply defined and a little moist at the edges. Its extent and depth are variable. A portion or an entire terminal phalanx of fingers and toes may be attacked, or the gangrene may be superficial or implicate the subcutaneous tissue also. It may develop subcutaneously at first, and, in some rare cases, attack a large portion of an extremity. On the gangrenous area, bullæ filled with dark serum may arise. About a week after development of the gangrene, a zone of demarcation forms around the spot, the dead portion shrinks, and mummification takes place. It may be cast off with or without suppuration. Moist gangrene may, however, occur, accompanied by swelling and infiltration of the deeper tissues, the formation of large bullæ, and of pus cavities in the skin; or a progressive course may be followed, and necrosis of extensive areas result.

The healing of the areas of symmetrical gangrene is slow, and similar to that of a torpid ulcer.

Etiology.—Symmetrical gangrene affects both sexes and all ages. It can not be regarded as a specific disease, but as the result of many different diseases and conditions. It has been ascribed to exposure to cold, and has been recorded as developing after severe bodily exertion with insufficient nourishment; also in young, chlorotic women, in the course of and after typhoid and typhus fevers, the exanthemata, intermittent fever, pneumonia, pleurisy, and beginning phthisis; in syphilis, and in chronic disturbances of nutrition from infections and intoxications which led to blood changes. Scleroderma, alcoholism, phosphorus poisoning, fright, anxiety, and hysteria, are also causes mentioned, as well as primary, chronic neuritis, and diseases of the brain and spinal cord. Syringomyelia, atrophica cerebri, tabes, etc., are likewise among recorded factors.

Pathology.—There is every reason to regard symmetrical gangrene as neurotic in origin. Raynaud claimed that the local syncope was due to a spasmodic contraction of the arterioles and capillaries. There might be relaxation and return to normal conditions before gangrene developed, but if this did not take place, and the small veins became contracted also, a higher grade of anæmia developed—local asphyxia—and from this gangrene resulted. Weber ascribed the contraction to the unstriated muscles, while Weiss was in favor of accusing the veins as the seat of the contraction. Hochenegg would accept both Raynaud's and Weber's opinions for certain cases, but for others he was inclined to think that an absence of trophic impulse was responsible for the nervous disturbances.

Diagnosis.—In a case presenting only gangrenous areas, it is not easy to determine that they are the result of Raynaud's disease. If in the history, the fact is obtained that their development was preceded by local syncope and asphyxia, then the diagnosis is cleared up. Local syncope must, moreover, be distinguished from anæmia due to cold.

Prognosis.—There may be only one attack, or several, and then permanent cure result, or recurrences may take place at long intervals. On the other hand, the attacks may appear continually over new areas, until death results from pyæmic or septicæmic infection, or from the basic disease. The prognosis is favorable when the cause can be removed, but unfavorable when severe cachexia exists, or a predisposition to neuroses, or when degenerative processes of the central or peripheral nervous systems are present.

Treatment.—All disturbances of nutrition and systemic deviations of health should receive appropriate and suitable treatment, and every attempt be made to remove any cachexia or dyscrasia in existence. Good nourishment and strict attention to the laws of hygiene should be enforced. Raynaud advised the constant current, one pole along the spine and the other along the affected limb. The current should be as strong as the patient can bear. Massage, cold applications, and rubbing are of use. When gangrene has occurred surgical treatment is indicated.

DIABETIC GANGRENE.

The development of gangrene of the skin as a complication of diabetes mellitus has long been observed to follow upon slight wounds and lesions of continuity of all kinds, and also after bruises, contusions, etc., without the skin being broken. The pathological changes follow immediately upon the injury or originate secondarily and after the occurrence of inflammation. Superficial inflammations due to bacterial proliferation may also lead to its production on the prepuce, scrotum, etc.; and lastly, it may arise in a spontaneous manner, similarly to neurotic gangrene, without any preceding wound or evidences of inflammation having been present.

Symptomatology.—The location of diabetic gangrene is not a definite one, but it appears on any portion of the body, though possibly more frequently on the lower limbs, owing to their being exposed to traumatisms; but the hands, fingers, etc., may likewise be its seat. The number of areas affected is without limit, and the process may consist of one patch or be multiple, these developing simultaneously or one after the other. It may be unilateral or symmetrical. When the gangrene is consecutive to some injury or wound, etc., there are no prodromal symptoms, but when it occurs spontaneously, it is often preceded by neuralgic pains and transitory attacks of livid or violaceous discoloration of the skin, with lowered surface temperature and sometimes loss of sensation. Very often superficial, it may affect the skin quite deeply, and, when inflammation has preceded, even the subcutaneous connective tissue. The diabetic gangrene always has a tendency to become progressive, is usually moist, with livid discoloration of the skin, the formation of bullæ, and

rapid decomposition ; but the dry form also may occur. Sometimes, preceded by a sensation of cold and a certain degree of anæsthesia, small bullæ arise and dry up into whitish sphacela. They come out in successive crops, and, as a result, a more or less large area may become necrotic.

In its course, it may be accompanied by the general symptoms incident to septic infection, and rapidly lead to death, or it may be slow in its development and march. Spontaneous healing does not often take place, but yet it may, and then more frequently when the gangrene is of the spontaneous type.

Diabetic gangrene occurs in both sexes, but perhaps more frequently in males than females. It likewise may develop at any age, and either early in the disease or as a late and serious manifestation.

Etiology.—Various theories have been propounded to explain the occurrence of gangrene in diabetics. Some have ascribed it to the abnormal presence of sugar in the tissues and the blood, while for others, there must be penetration of micro-organisms through some lesion of continuity, and these, in addition to the well-known low resisting powers of the tissues of diabetes, occasion the gangrene. The spontaneous form is probably due to some nerve change, and is neurotic in character.

The **treatment** of diabetic gangrene demands the dietetic and medicinal procedures applicable to diabetes. Locally, strict antisepsis is indicated. Cases which are acute, and in which septic symptoms are marked, call for surgical treatment and operative interference.

CLASS II.—HÆMORRHAGES.

PURPURA. (CHARLES W. ALLEN.)

Derivation: *πορφύρα*, purple.

PURPURA is the appropriate designation for that class of affections which is characterized by hæmorrhage into the skin not due to traumatic effect. It is called by the Germans *Blutfleckenkrankheit*, and is sometimes vulgarly known as *purples*, the lesions in some stages at least presenting a decidedly purple color. Unlike many more strictly skin affections, it does not constitute a morbid entity, but the name is rather to be looked upon as one under which we must, for the present at least, include a variety of processes resulting from different causes. It has seemed to me that of all conditions included in the department of dermatology, this is the one which least deserves a place, so rarely is the visible objective symptom upon the surface the one of paramount importance, or the one requiring or being susceptible of treatment. From a diagnostic point of view, however, its standing is not to be questioned, for in many instances the skin lesions furnish the only evidences of the disease. Small round or oval spots of extravasated blood within or beneath the epidermis are called **petechiæ**. These are the most common forms, and from pinhead-size may reach the diameter of half an inch. The term *hæmorrhæa petechialis* has indeed been employed as a synonym, indicating at once the lesion and its process of formation. Instead of implicating the epidermis, the hæmorrhage may occur solely in the corium, the papillæ, or even in the sudoriparous glands and hair-follicles, or it may be in the connective tissue beneath the skin. We may find, too, gradations in the size, extent, and color of the spot, lengthened streaks of discoloration being called **vibices**, and bruiselike patches **ecchymoses**, the extravasation taking place, it would appear, in the direction of least resistance, and at times producing lines, bands, or patches of irregular outline, and, as I have myself seen in one instance, ringlike forms. While not raised above the surface in its typical form, papular elevations, bullæ with hæmorrhagic contents, and hæmatomata may occur as the sole or predominating lesion.

Although many purpuras, as we shall see, must be looked upon as purely symptomatic, still, in the present state of incomplete knowledge

concerning the conditions determining the cutaneous hæmorrhage, it is thought best to retain the two chief divisions usually made of the subject, and we shall hence consider separately *purpura simplex* and *purpura hæmorrhagica*, leaving the other forms to be dealt with by themselves. The term *purpura*, standing unqualified, has a very variable significance, and it must be borne in mind that widely dissimilar states, due to nerve or blood disorders, poisons, drugs, infectious substances, or mechanical conditions, may be responsible for the eruptive appearances.

PURPURA SIMPLEX.

As implied by its designation, this is the less serious form, but it is by far the more frequent. It occurs in those to all appearances otherwise healthy, and usually without premonitory warning, though at times *malaise*, chilliness, and febrile symptoms may have been present. The eruption is found scattered over the lower extremities, especially marked below the knees, and for the most part petechial—i. e., small round, or oval, red, deep wine-colored, brownish or purplish spots, not disappearing under pressure. The number of separate lesions may be very limited, or so numerous as to be almost confluent, the individual spots not usually exceeding the size of a flea-bite. Though both extremities are expected to be found equally affected, instances of one-sided eruption are occasionally observed. Instead of the legs alone showing evidences of the affection, spots may be discovered upon the arms, trunk, or face, as well as upon the mucous membranes of the mouth. I have observed lesions in the latter situation when few were to be discovered upon the skin surface. In children purpuric spots often occur first upon the face or neck. The eruption may come out in successive crops, and in this way the usual duration of from one to three weeks may be prolonged, and even after complete disappearance recurrence may take place.

At times some form of debility is present in the subject of *purpura*, and in women coincident menstrual derangements are not uncommon. This form may go over into the next to be considered.

PURPURA HÆMORRHAGICA.

Synonym : *Morbus Maculosus Werlhoffii*.

It is not an easy task to make a separate study of *purpura hæmorrhagica*, and, indeed, at times the two forms seem so intimately associated that it becomes a matter of doubt whether to class a given case under the one or the other.

The hæmorrhagic form is less frequent than the simple, and is preceded and accompanied by much more pronounced symptoms. The in-

dividual lesions are, as a rule, larger, and have a wider distribution over the surface. There is fever at times preceding or following the eruption, and often great prostration, with pallor of the whole surface from repeated hæmorrhages, which may take place from any of the mucous membranes. Instead of terminating favorably in a matter of three weeks, a fatal ending is not unusual, either from loss of blood or from extravasation into vital organs.

The appearances presented by the eruption differ somewhat, according to the previous condition of the individual. In debilitated subjects, and in the puerperal state, the eruption may first appear as bright-colored lesions, which gradually grow darker and assume the purple hue. In pregnancy, too, there is usually increased temperature. The condition here often has a grave significance, and many cases end fatally, either by reason of *post-partum* hæmorrhage or from a septic state, in all probability due to the same process on which the purpura depends, causing septicæmic complications.

Phillips has studied the question in this connection and considers the prognosis bad, both as to premature birth and as to the safety of the mother. As it occurs in the newborn, the association of hæmorrhages with cutaneous ecchymoses also demands an unfavorable prognosis. In eleven such cases collected by Townsend there were but two recoveries.

The eruption in the hæmorrhagic form begins as it does in the simple—mostly upon the legs, and gradually extends, perhaps in crops, to the upper parts. Bullous forms may result from effusion of blood taking place between the layers of the epidermis, but it must not be forgotten that the lesions in pemphigoid diseases may also become hæmorrhagic. The most important, and indeed characteristic, feature of this variety of purpura is the tendency to bleeding from various organs of the body, and bloody stools, bloody urine, epistaxis, hæmoptysis, and hæmatemesis are not uncommon, while internal hæmorrhage is ever a source of anxiety and an occasional cause of sudden death.

Symptomatology.—*Purpura simplex* may occur without any symptoms other than the objective one, and the patient only knows of his affection by seeing the discolorations. Sometimes there are prodromal sensations of *malaise* and feverishness.

In the pseudo-rheumatic variety pains in and about the joints and in the muscles may be present.

In *purpura hæmorrhagica* there may be marked debility at the onset, with headache and possibly convulsions. Hæmorrhage from some mucous surface may be the first thing to attract attention, and Musser says abundant hæmorrhages by a single organ may be the only manifestation of the condition.

Pathology.—The individual lesion in the skin is almost always due to rupture of the wall of a small vessel, but it may result from the escape of some blood-coloring matter through the wall of a diseased or apparently healthy vessel. In some instances a condition is found similar to that known as desquamative endarteritis with dilatation. In other cases the post mortem shows an unaltered vessel wall, but the lumen filled with fibrinous clots, emboli, or masses of micro-organisms, the purpuric spot resulting from transudation or diapedesis.

The hæmoglobin may be found diminished, while the number of red blood-corpuscles is not much decreased, even where extensive hæmorrhages have taken place, and some eruptions have been put down by authors as due to hæmoglobinæmia, with consequent hæmatinorrhagia, rather than to true hæmorrhage into the skin. This is especially true of the purpura of cancerous origin (Rossi). When the purpuric lesion is the result of rupture it may have been occasioned either by the diminished resistance on the part of the vessel's wall, or by an increased pressure upon the wall from the heart side, or both conditions may exist and be more or less under the influence of the nervous system. Indeed, one author has gone so far as to look upon all purpuras as due to tropho-neurotic origin. While this view is far too radical, it must be admitted that changes in the walls as well as in the caliber of vessels are more or less under the control of the nerves. Experimentally it has been demonstrated that the sympathetic has a decided influence upon the production of purpura, and it is quite possible for an excitation of its fibers to determine slight extravasations at particular points.

Mollière relates the case of a little girl in whom a purpura, occupying one lateral half of the body and extending slightly beyond the median line, was due to compression of filaments of the sympathetic, along with the roots of spinal nerves.

Hysterical ecchymoses have an interest in this connection as showing the influence exerted by the nerves. Raymond relates an instance of ecchymoses appearing suddenly after an attack of *grande hystérie* and persisting for two years upon the patient's legs and feet, which were paralyzed and anæsthetic. Purpura from emotional causes, that accompanying neuralgia, or following the first inhalations of chloroform, must likewise be attributed to nerve influence.

Numerous observations have been made upon changes in the blood, but the results are quite diverse, and the question requires still further study.

Conditions of stasis, embolism, and thrombosis are not unusual, and Claisse, along with others, has found the small vessels obliterated by microbial embolism; but obstruction can likewise occur from endothelial collections, simple clots, groups of leucocytes, etc. The fibrin-forming properties of the blood are said to be diminished.

Etiology.—In entering upon the causation of purpura it becomes necessary to make some sort of classification of the subject, for so diverse are the factors which in different cases enter into its production, that a simple enumeration of them would only lead to confusion.

Age.—While usually regarded as a disease of adolescence, middle and late life appear to show a greater proportion of purpura—though no age is exempt—and it sometimes occurs even as a congenital condition.

Seasons.—It appears more frequently toward the close of the cold and damp seasons, as in the early spring.

Atmospheric Conditions have their influence, as is seen in the purpuras which follow mountain climbing and sudden changes to high altitudes.

Hygienic Surroundings.—Damp and unsalubrious dwellings, exposure to inclement weather, insufficient clothing, overwork, long marches, and lack of proper food, all have a decided effect.

Systemic Diseases.—Those in some way debilitated are more apt to fall victims to purpura, though seemingly healthy persons not infrequently suffer. Among diseased conditions predisposing to it may be mentioned spanæmia, or poverty of the blood in its coagulating qualities, chronic Bright's disease, syphilis, scorbutus, hæmophilia, ulcer of the stomach, amygdalitis, septicæmia, infectious fevers, some heart diseases, cachectic states, fatty and waxy degeneration, leucocythæmia, anæmic states, and conditions favoring jaundice.

Infections.—Purpura occurring in the course of specific fevers, typhus, variola, measles, and scarlatina, or that following influenza, pneumonia, gangrene, mastitis, putrid amygdalitis, cerebro-spinal meningitis, or various suppurative processes, has come to be looked upon as due, in the majority of instances, to some infection. The petechiæ observed in septicæmias are not to be regarded as constituting purpura; still, instances may occur in which extensive purpuric eruptions do appear and at times prove rapidly fatal. Infection from the streptococcus as well as from the staphylococcus, the pneumococcus, and the bacillus of Letzerich have been repeatedly shown to be possible, and it is now well known that injection of the streptococcus in the mouse or rabbit will produce a purpuric eruption. Kolb has examined five cases of purpura hæmorrhagica, three of which ended fatally, and while no bacteria were found in the blood there were discovered at the autopsy, three to four hours after death, small oval rods with rounded extremities, having no movements of their own. They develop on ordinary media and at ordinary temperatures. Mice were killed in two or three days by an injection of one drop of culture bouillon, while rabbits die after inoculation and show characteristic hæmorrhage.

Petrone detected micrococci in the blood of two well-marked cases,

one associated with a gangrenous process. This writer is convinced, from the clinical course as well as from the post-mortem appearances, that the nature of the process is infectious. The cocci found were smaller than those peculiar to osteomyelitis, and their disposition in chains was similar to that found in diphtheria. The possibility of the microbes being inclosed in small blood-clots within the vessels would account for the difficulty in obtaining cultures from the blood during life. Thus in a purpura accompanying amygdalitis with streptococci, Desnos examined the blood with negative results, but in a second case sections through the purpuric spot disclosed microbes inclosed in a fibrinous clot within the cavity of a vessel. Others have found the capillaries plugged by micro-organisms, and Watson-Cheyne has seen streptococci in long chains so massed together as to form an obstruction. Letzerich finds that this bacillus does not present the same appearance in all stages of an attack, and suggests that others may have described this same bacillus in one of its several forms. He believes that all purpuras are due to the bacillus, and that the varieties depend upon the intensity of the poison and the individual's powers of resistance.

The description of the bacilli found by Tizzoni and Giovannini in 1889, by Babes in 1890, and by Kolb in 1891, presents such slight differences—all showing more or less oval form with rounded ends, and existing usually in pairs—that one can readily accept them as belonging to the same group, and apply Letzerich's proposition in accounting for the lack of identity.

Among the infectious purpuras must be included those which accompany gangrenous processes, especially gangrenous gingivitis. They may be of the hæmorrhagic or simple variety, or may exist simply as ecchymoses.

I have observed one instance in which ecchymotic spots appeared on various parts of the body and disappeared again spontaneously before there was any evidence of the gangrenous stomatitis, which subsequently developed and went on to production of what is commonly known as noma, with perforation of the cheek, and ending rapidly in death. Hard œdema may accompany these gangrenous cases, and after death hæmorrhagic spots may be found in the internal organs, as well as infarctions of the spleen, kidneys, etc.

Such instances would appear due to absorption by the digestive or respiratory tracts of some poisonous substance, possibly ptomaines or toxins, resulting from the presence of bacteria. The situation of the gangrenous process in the mouth would favor such absorption and such a theory, but the development of the gangrene after the ecchymoses had existed for some time, as in my own case just mentioned, would point rather to a general process of which the gangrene formed part.

That purpura may be occasioned by the action of toxins would seem plausible from the experiments of Charrin and Ruffer, who by intravenous and subcutaneous injections of the soluble products of the pyocyaneus bacillus provoked hæmorrhages. This pyocyanogenic agent inoculated in the eel appears capable of determining at times the appearances of purpura. In Kolb's experiments, too, the sterilized and filtered cultures were found inoculable, showing that the products of the bacilli as well as the bacilli themselves could produce purpuric states. Pop has also found that besides the filtered cultures the albuminose and enzymes extracted from them are capable of producing by themselves intense purpuras and hæmorrhages.

Under infectious purpuras should be classed also those which follow severe constitutional diseases, such as variola, typhus, scarlatina, measles, cerebro-spinal meningitis, pneumonia, and possibly influenza and others. Here, however, the infection should be considered as secondary.

Voituriez speaks of a pneumonic purpura which he considers due to the pneumococcus. In one case related by him the purpura was followed by circumscribed œdema, but this is a symptom not uncommonly associated with purpuras of apparently widely diverse origin.

Munro has published an instance of hæmorrhagic exanthem consecutive to influenza in which hard œdema was present. Bowen has recently studied in an able manner the whole question of the association of purpura and acute circumscribed œdema, to which Henoch first called attention in 1874, and finds that the œdema is a symptom not always due to the same cause, while "the close relationship and even interchangeability of certain of these cases of purpura with urticaria, with erythema nodosum, and with angioneurotic œdema, favor the suggestion that the entire group may depend upon some poison—an alkaloid, possibly—the result of faulty chylipoietic metabolism, which in varying doses in different constitutions excites in one urticaria, in a second peliosis rheumatica, and in a third a fatal form of purpura."

Under secondary infectious purpuras one could also properly class those following scarlatina, of which I have recently observed a rather striking example. After the period of desquamation was well advanced in the case of a young girl, purpuric spots began to appear upon the mucous membranes of the mouth, and the skin over both cheeks became the seat of large purple rings and blotches, until nearly the whole surface was covered. The epidermis over these lesions desquamated in large flakes, and the child made a good recovery.

Purpura fulminans is the name proposed by Henoch, and adopted by others, for that form which seems to overwhelm the system in an acute attack, and often destroys life quickly. Two or more cases may occur in the same family, or among those subjected to the same surround-

ings and influences—a circumstance which of itself points clearly to an origin in infection. Roque has recently observed two instances in one family beginning with diarrhœa, which in one patient became bloody on the sixth day, and in both of which there was a copious eruption of purpura coming out in crops. This observer does not regard such instances as due to a specific infection, but to the action upon the vasomotors of a poison capable of paralyzing or exciting them. Thus purpura might or might not be induced, according to the intensity of the excitation, and hence can not be looked upon as an essential symptom.

In a number of instances the fulminating form of purpura has followed scarlatina. It is almost always fatal. In this connection it is interesting to note the occurrence of purpura in those already affected with impetigo, making it appear as though the infectious element had effected an entrance to the economy through the open lesions of the latter disease. Acute fulminant purpura may run a very rapid course, being attended with high fever and typhoid symptoms.

Maily relates the case of an ill-conditioned boy, who after a chill developed over the whole body, excepting the face, purpuric spots, most of which were over an inch in diameter. There was delirium, temperature reaching 106°, pain in the arms but no joint swellings, collapse and death after about twenty-four hours from the onset.

The etiology of these cases is still very obscure.

Purpuric eruptions—not to be confounded with purpura proper—develop in the course of a number of general diseases, such as acute yellow atrophy, typhoid, chronic Bright's disease, suppurating amygdalitis, bronchitis, pneumonia, syphilis, hæmophilia, rheumatism, cardiac affections, cancer, tuberculosis, etc. These latter have at times been regarded as *premonitory purpuras*, coming on, as they may, before any marked evidences of the diseases which they accompany. The purpura of syphilis is limited to the skin and mucous-membrane surfaces, including the conjunctiva, while no lesions are found upon internal organs. It is probable that the condition of the blood is here more at fault than the changes which syphilis may bring about in the vascular walls. In the diagnosis of this purpuric manifestation in syphilitics it must be remembered that an iodic purpura is not uncommon in this class of patients. Sometimes syphilitic eruptions become hæmorrhagic or purpuric, but the condition is one of diapedesis of red blood-corpuscles into the pre-existing erythematous or inflammatory lesion, due either to individual predisposition or to the direct effect of the syphilis.

Purpura Rheumatica.—When a simple purpuric eruption exists in association with any of the arthropathies, it seems to me rational to look upon it either as a mere chance association (the various forms of rheumatic disease being so common and so rarely attended with purpuric manifesta-

tions), or else to regard the effusions about the joints, within the pericardium, and the other pseudo-rheumatic symptoms as due to the same general causes (probably infections) which have been operative in producing the skin lesions. Were there a purpura of strictly rheumatic origin, it should, theoretically, be more common among rheumatics than it actually is. The joint pains may precede the eruption by several days. There is fever, which may be synchronous with the purpuric outbreak, and the spots are apt to be raised above the level of the skin surface. In some cases of peliosis it is interesting to note the failure of salicylates and other rheumatic remedies to give the relief which would be expected of them if the condition were really rheumatic.

Purpura thrombotica is the name given by Hutchinson to a form usually affecting women. The lesions are bright red at first, and, instead of being abruptly margined, shade off gradually into the surrounding skin. The condition is closely allied to erythema nodosum and multiforme—conditions often present in rheumatic persons. This, like the preceding form, probably deserves a place among the exudative erythemas of hæmorrhagic type, or the multiform dermatoses attended with purpuric features.

Purpura in amygdalitis may be due, it would appear, to streptococci as well as to staphylococci, pneumococci, and other micro-organisms, or to the bacillus of Letzerich.

Purpura Neonatorum.—In the newborn, purpura may be due to the marked changes which occur in the circulation at this time, or may have some mechanical cause. In the families of hæmophilics, infants may be born with petechiæ and ecchymoses upon the surface, and visceral hæmorrhages are not uncommon. From Somma's study of purpura in infants at the breast, he finds that all cases coincide with gastro-intestinal troubles of pronounced type, and he draws the conclusion that enteritis has been the first cause of the pathological phenomena, while infection has taken place by the penetration of some still unrecognized micro-organisms by way of the eroded gastro-intestinal mucous membrane.

This surely appears plausible in view of the known occurrence of purpura in cases of ulcer of the stomach.

Syphilis and septicæmia are considered by Townsend as rarely the cause. He thinks the theory of infection well founded for most cases.

Purpura in pregnancy is attended with grave significance, many cases ending fatally, either by reason of miscarriage, *post-partum* hæmorrhage, and septicæmia complications, or from the severity of the purpuric process itself. Phillips, who has studied the question, considers the prognosis bad both as to premature birth and the safety of the patient. The affection is not, as a rule, transmitted to the foetus, but it may be classed as a cause of foetal mortality.

Purpura from Drugs and Poisons.—A variety of drugs are capable of determining purpuric symptoms. Among the most common may be mentioned the iodide of potassium, quinine, phosphorus, arsenic, salicylic acid, chloral, arnica, iodine, alcohol, ergot, belladonna. Cases have been recorded from the ingestion of coal tar, from eating asparagus, and from inhaling benzoin steam, while those due to chloroform have already been mentioned.

The venom of snake bite has been observed to occasion purpuric eruptions in numerous instances.

Vascular changes, some of which are mechanical and some of vital nature, present factors having a decided bearing upon etiology. Thus may be instanced states in which there is lack of support offered the vessels by surrounding tissues in certain conditions of weakness, such as those which accompany parturition, prolonged illness, and old age (purpura senilis). In some persons, too, there seems to be a congenital, or possibly acquired, weakness of the vascular coats, which almost constitutes the condition of hæmophilia. Among the changes in the vessels themselves, perhaps the most important is the lardaceous degeneration, which may be engendered by various morbid states. Waxy degeneration has also been found in some instances, as well as simple inflammatory changes in the vessel walls.

Syphilis may induce purpura, by reason of the endarteritis for which it is responsible, while hæmorrhagic changes in its own peculiar skin lesions are at times noted.

Besides having the effect of weakening the vascular coats, the degenerative changes may favor obstruction.

Circulatory and Blood Changes.—It seems probable that in certain states, as especially in the newborn, the sudden changes which take place in the circulation permit, for a brief period, the escape of blood elements through the vascular walls, whose nutrition has been interfered with. Diminished atmospheric pressure acts in much the same way. Thrombosis or embolism—from micro-organisms, simple blood-clot, masses of cells, or vegetation fragments—undoubtedly act to occasion extravasation.

Sudden extreme contraction of the vessels from muscular effort (parturition, fits of severe coughing, epileptic seizures, etc.), as well as over-dilatation in conditions of congestion, may cause rupture and escape of blood into the skin, but in all probability some poison is exerting its influence upon the blood in these cases, making possible the formation of purpuric spots.

Letzerich found that bacilli lodged in capillary vessels exercised a chemical influence on the albumin of the blood, changing it into a gelatinous substance capable of producing disturbances in the circulation leading to extravasation.

Nerve Changes.—We have already made reference to the influence of the nervous system. Aside from the eruptions associated with angio-neurotic œdema, neuralgias, etc., there seem to be certain purpuras to which the term *neurotic* may be applied (Henoch, Couty). The individual lesions are small, appear in crops, and are accompanied by gastro-intestinal disturbances. Occasionally a purpura will follow such functional nervous perturbations as are occasioned by great mental shock, prolonged grief, or deep emotion. Here one may argue that the nerves which preside over the contraction of minute vessels have been altered in their functional activity. Such explanation would apply to those purpuras suddenly appearing after the first few inhalations of chloroform, mentioned by Morel-Lavallée and others.

Again, as Weir Mitchell has suggested, neural conditions may be capable of directly enfeebling the vascular walls, so that under arterial pressure they either give way or become relaxed.

Purpura myélopathique has been applied to those cases following or occurring in the course of chronic affections of the spinal cord. White found in one case acute inflammation of the semilunar and cervical ganglia.

Course.—Purpura simplex lasts from one to four weeks in mild cases. Disappearance of the individual lesion varies with its extent and superficial or deep situation, and hæmatin may be retained in the skin for a period varying with the activity of the cutaneous vessels.

In the process of absorption the lesion passes through the varying shades of the familiar bruise mark. During its evolution, too, the color of the spot has often passed from the bright red of a perfectly recent extravasation to a brownish color, and, as decline of the lesion approached complete disappearance, a dull gray hue has taken its place, so that by the shade alone the approximate age of each could be determined.

The hæmorrhagic form is usually acute, ending in a week or two either favorably or in death from hæmorrhâge. If recovery has taken place an anæmic condition may persist, which is proportionate to the amount of blood lost.

Some cases are prolonged by repeated hæmorrhages and recurrent eruptions and the term *chronic purpura* seems applicable to certain persistent forms.

Diagnosis.—Purpura simplex is distinguished from purpura hæmorrhagica chiefly by the absence of hæmorrhage from mucous surfaces, or, as a rare occurrence, from the skin lesions themselves, but, as already intimated, at the onset it is impossible to say that a case may not become hæmorrhagic. In the latter, however, the prodromal depression is much more pronounced, and there is fever.

From the many conditions accompanied by purpuric manifestations,

idiopathic purpura must be distinguished, for the most part, by the absence of symptoms peculiar to these states and by the history. Scorbutus is the most important of these, and, being so closely allied to purpura, is the one most likely to cause confusion. Here we find greater muscular pain, larger ecchymotic spots, much more pronounced swelling of the gums attended with loosening of the teeth, and a peculiar induration of the tissues of the leg, amounting, in some cases I have seen, to boardlike hardness and very marked discoloration. Much depression usually precedes the eruption, but in uncomplicated cases fever is absent. Here, too, the etiological element of lack of vegetable diet comes to our aid.

Pernicious anæmia, leucocythæmia, cancer, and other cachexias have their own symptoms, by which the nature of purpuric symptoms occurring in their course are made known. Drug eruptions are to be suspected when the history shows that an iodine preparation, quinine, ergot, phosphorus, etc., has been taken. Hæmophilia may present every variety of extravasation from the size of a pin's point to that of the palm, or larger, but a hereditary history can usually be elicited. Maculæ ceruleæ, due to the presence of pediculi, are fainter and more localized spots.

Flea-bites so closely resemble purpura that the term *purpura pulicosa* has been employed. While otherwise identical, the petechiæ show, at least on close inspection, a darker central point where the skin has been punctured. The error has been made of describing as epidemic purpura an outbreak caused by the festive but irritating pulex. Hæmorrhagic smallpox is a most important condition not to be mistaken for a simple purpura.

Cerebro-spinal or spotted fever may have purple or brownish spots among its first manifestations, but the subsequent cerebral symptoms will explain them. In spasmodic cough, pertussis, violent efforts in vomiting, epileptic seizures, etc., the extravasation is in most cases probably due to the mechanical effect of strain and heart pressure, and should be regarded as accidental capillary apoplexies, and not as having anything more in common with true purpura than the appearances of the lesions.

In typhus, the eruption appears about the fifth day, is generalized and at first red, becoming dusky and rarely purple. In typhoid, during convalescence, petechiæ and ecchymoses may occur, especially in hæmophilics.

Erythema nodosum and urticaria lesions may show purpuric centers (*purpura urticans*) persisting after the more characteristic features of the lesion have disappeared.

In forensic medicine the differential diagnosis between ecchymoses from violence and those from disease is often of great moment. Both persist after death. In such cases it is well to remember that extensive effusions result from slight injuries in those predisposed, and may even

follow muscular effort, the skin over the discolored area being free from evidence of injury. Hypostasis must be borne in mind by the medical jurist, and the fact that even punctiform hæmorrhages in both skin and mucous membranes may be due to asphyxia.

Hysterical ecchymoses have here an importance. They were studied in their medico-legal aspects by Magnus Huss in 1857; and Gilles de la Tourette describes an interesting case in the *Gazette Médicale de Paris*, August 2, 1890.

Prognosis as to termination is favorable in purpura simplex, but relapses are frequent, especially in women.

In purpura hæmorrhagica, too, the prognosis is generally good, excepting in the newborn, in pregnancy, and in the feeble, especially where the early hæmorrhages are severe. Sudden death may occur at any time, even in seemingly mild cases, from cerebral or other internal hæmorrhage. In prognostication one must remember that the simple form may assume hæmorrhagic features, and that at best the duration is very variable. Feeble pulse, high fever, cerebral symptoms, delirium, etc., portend a fatal ending.

Treatment.—Mild attacks give so little annoyance, have such slight significance, and are withal so little influenced by any medication, that they call for little treatment. The underlying causative conditions should be sought for, that curative efforts may be intelligently directed against them. Rest is essential, and the recumbent position is advisable even in cases of mild onset. In severe forms rest must be absolute.

Affected limbs should be neatly bandaged, especially when œdema accompanies the eruption; and where joint regions show an abundant eruption immobility should be secured, since the stretching to which the tissues are here subjected may induce not only cutaneous lesions, but possibly similar ones upon the synovial membranes, leading to effusion within the joint. External warmth is often called for, especially if there be diminished surface heat in the affected members. Applications of perchloride or persulphate of iron, or other styptic, should be applied to bleeding surfaces which can be reached.

Nutrition must be aided by an abundance of easily digested food, and especially foods rich in fats, milk, cream, oils. Remove the patient from unhygienic surroundings, and secure for him plenty of fresh air and sunlight. In recurrent attacks order change of air, dwelling, occupation, a course of salt or sulphur baths, or such other hygienic measures as the circumstances warrant. Strong wines and other alcoholic drinks appear to exert hæmostatic effects while they increase the strength in some instances.

Charge the patient to avoid fatigues after as well as during an attack, for muscular effort is often observed to bring on a renewal of the

eruption, an attack of hæmaturia, or other manifestation of the latent tendency.

The list of valuable drugs for internal use is not long. Of these, turpentine is one of the most effective in controlling hæmorrhage. It can be freely administered in emulsion or in capsule, in quantities to suit the requirements of the case. It also has a beneficial action when inhaled. It appears to be especially indicated where there is much debility with relaxation of the blood-vessels, and more particularly in the hæmorrhages from mucous-membrane surfaces. Another remedy much praised is the fluid extract of *hamamelis Virginica* in half-drachm or drachm doses.

Ergot, or one of its derivatives, ergotin (gr. ss. to gr. v, every four hours), ergotinine (gr. $\frac{1}{250}$ to $\frac{1}{125}$), by the mouth or hypodermic injection. Tannic or gallic acid, vegetable and mineral acids properly diluted, nitrate of silver in pill (gr. $\frac{1}{8}$ to $\frac{1}{4}$), especially in hæmatemesis. Preparations of iron are useful in many cases, especially the tincture of the chloride in those showing anæmia, possessing as it does hæmostatic, astringent, and tonic properties. Quinine has been found a valuable tonic, and bitter tonics in general appear to act well. The oil of *erigeron canadense*, in dose of five to ten drops on sugar, has internal hæmostatic properties, but is less reliable than turpentine.

CLASS III.—HYPERTROPHIES.

LENTIGO. (JAMES NEVINS HYDE.)

Deriv., Lat., *lens*, a lentil.

Synonyms: Freckles; Éphélides; Ger., Sommersprossen, Linsenflecken; Fr., Lentilles; Éphélides; Lentiforme solaire; Ital., Lentigine; Rossore; Efelide.

Statistical frequency in America, 0.103.

Definition.—Freckles are multiple and circumscribed, pinhead to pea-sized pigment macules of the skin, occurring usually on the portions of the body exposed to light.

Symptomatology.—The disorder usually begins in the second decade of life, and is characterized by the occurrence, chiefly upon the exposed parts of the body, of rounded and irregularly shaped patches of pigmentation, varying in size from a pinhead to a pea, yellowish, yellowish brown, brownish, and, in marked cases, blackish in shade. The parts chiefly affected are the exposed portions of the integument chiefly subjected to the action of sunlight, particularly the parts of the face such as the temples and the cheeks, the back of the hands, and also, though less commonly, the unprotected portions of the body, such as the forearms and arms, the back and the buttocks, and the genital region in both sexes. They may be few in number or very thickly set over the affected parts; and occur with a marked predominance in persons who have light-colored skins, particularly light hair and light eyes, and also in those who are especially sensitive to the action of the external causes effective in producing the disorder. They are most common in the summer season, coming on often with remarkable suddenness, and in some cases wholly disappearing during the winter season, while in others they persist to a more or less marked extent throughout the year.

They may be congenital as well as acquired; and the parts which are exposed only to cold weather, and which still exhibit these lesions, are popularly described as the seat of “cold freckles.” Rare instances are recorded in which these symptoms exist only upon one side of the body; and in cases they develop into large-sized, confluent patches, which exhibit the features of the smaller lesions. The disorder is at times symptomatic of more serious conditions, as, for example, in the disorder known as *angioma pigmentosum et atrophicum*.

Pathology and Morbid Anatomy.—Pigmentations of the type seen in freckles are due only to a deposit of pigment in excess in circumscribed portions of the rete mucosum. The corium, in none of its parts, exhibits the slightest pathological change. The pigment occurs in the lower portions of the rete, staining in excess both the cell-nuclei and the cells themselves. Pigmented particles are recognized also between the epithelial masses.

Etiology.—Freckles are produced by exposure to the direct action of solar heat and light, and also to certain moist conditions of the atmosphere in the summer season, as, for instance, when the skin is exposed to fogs and storms of rain. Both sexes are equally apt to exhibit the symptoms of the disease, which, as already stated, is more common in those who have a light complexion and hair of corresponding color. In the dark races—for example, the African—these lesions may, however, be seen in typical expression.

Diagnosis.—Lentigo is distinguished from chloasma by the limitation of the pigment anomalies to circumscribed points or spots; and by the absence of a diffuse coloration of the skin. It is also distinguished by its occurrence on the exposed portions of the body.

Prognosis.—Freckles are usually relieved by a change of season or climate. They are also amenable to local treatment.

Treatment.—The treatment of lentigo is identical with that of chloasma.

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CHLOASMA. (JAMES NEVINS HYDE.)

Deriv., Gr., χλοᾶζω, to be green.

Synonyms: Liver spots; masks; Fr., Taches Hépatiques; Ger., Pigmentflecken; Ital., Macchie Epatiche.

Statistical frequency in America, 0.452.

Definition.—Chloasma is characterized by the occurrence of single or multiple, circumscribed or diffuse pigment discolorations of the surfaces of the body, varying in shade from a light yellow to a deep brown or even blackish hue.

Symptomatology.—Chloasma occurs in fairly well-defined patches of coloration usually symmetrically distributed over the face, and in some

cases other portions of the body, in color varying from the lightest shade of yellowish or buff or fawn to the deeper browns, and even to the bronze and blackish hue of the deepest pigmentation seen in the skin. When the skin is very generally affected with a pigment disorder of this class, the regions which are physiologically most deeply tinted receive the darkest shades of color—for example, the axillæ, the umbilicus, the region of the buttocks, the ano-genital region, and the flexures of the joints.

Several clinical forms of chloasma are to be recognized as follows :

(a) *Symptomatic Chloasma*.—This may be a coincident or consequence of a serious malady affecting both the skin and viscera, more particularly the liver, the suprarenal capsules, the uterus, and the spleen. The cutaneous affections which are most liable to display the lesions of chloasma, are lepra, syphilis, and lichen planus (in the last-named disorder there often results a smoky-black or purplish-black hue of the skin), symptomatic erythemata, scleroderma, and fibroma. It is also conspicuously visible in certain forms of senile atrophy of the skin; and, briefly, in all places which have been the seat of a well-marked congestive or exudative process. It is also, when a sequel of such affection, most conspicuous on the lower extremities, and as a result of gravity particularly between the knee and the foot.

(b) *Chloasma Uterinum*.—Chloasma uterinum is most noticeable in women who have either been sterile or have had a series of pregnancies, and who exhibit, symmetrically distributed over the face, the nipples, the central line of the abdomen, and other portions of the body, a yellowish-brown, well or ill defined coloration of the skin. It is most noticeable and conspicuous in the face, where it produces the appearance of a mask, spreading over the temples and reaching over the cheeks, in extreme cases involving most of the face and extending down over the body. The resemblance of the shade of color to that displayed in icterus has suggested the name “liver-colored spots,” by which this coloration is sometimes designated. In exceptional cases the color is a deep bronze. In still others it occurs in patches as discrete as in the case of freckles, and, in some, the changes of color from light to dark in the same individual under different conditions (climatic changes of season, pregnancy, etc.) are very distinct.

(c) *Chloasma Cachecticum*.—Here also the discoloration may be limited to the face, where a peculiarly sallow, earthy, icteroid, or very dark hue of the skin is produced; or the chloasma may extend largely over the surface of the body. Conspicuous examples of this are represented in Addison’s disease, in cancer, and in leprosy, the disorder in the last-named affection being usually most distinct upon the lower limbs. The discoloration may also be seen either in circumscribed patches or

diffusely about the face and body, as in Graves's disease, abdominal tuberculosis, and in well-marked cases of malaria. It can be seen most perfectly, and for longer periods of time than in other cases, in the subjects of what is known as "Chagres fever," a severe form of malaria.

(d) *Chloasma Caloricum*.—Chloasma caloricum is really due to the causes enumerated above. Here, instead of producing freckles, long exposure of the face and hands to the action of sunlight, or to heat radiated from artificial sources, produces a deep and uniform dark staining of the face, the neck, the chest, the hands, and the forearms, and sometimes also of the covered portions of the body. It is said that persons who are most vigorous are particularly liable to this form of coloration. The action of severe cold operates in precisely the same way, first, by inducing a transitory or persistent congestion of the cutaneous capillaries; and, second, by permitting this congestion to become the source of pigment deposit which remains in excess in the epidermis of the skin thus exposed.

(e) *Chloasma Traumaticum*.—Chloasma traumaticum is induced by the operation of causes which eventually have the effect of the action of heat and cold upon the surface. In this way occur the deep colorations of the skin in regions of prolonged pressure and friction (hernial trusses, bandages), of scratching to relieve the itching of eczema, and of all prolonged efforts to relieve cutaneous pruritus. With these should be classed the action of sinapisms and blisters, and the deep discolorations which sometimes result from the action of parasites upon the surface of the skin (lice, bugs, etc.).

In a few cases the mucous surfaces are involved in colorations of this sort, which in general are to be referred to systemic rather than to local causes.

The *ptyriasis nigra*, of Willan, is a discoloration of dark hue, of the sort described above, occurring both in the senile state and in persons whose skin has long been the seat of irritation. The so-called "vagabond's disease" is a condition recognized in tramps, paupers, inmates of asylums, and persons of like class, whose skin has long been uncleansed, and has been the seat of continuous irritation and consequent scratching.

Pathology and Morbid Anatomy.—In chloasma, as in lentigo, the discoloration is produced by a deposit of pigment in excess of the normal quantity, circumscribed or diffused, in the mucous layer of the epidermis, not involving the papillary portion of the corium. In some cases the vessels in the papillæ have been found to a certain degree dilated. In the melanosis of Addison's disease, however, and similar grave forms of chloasma, pigmented masses have been discovered below

the rete in the upper portion of the corium. Migratory cells, provided with an excess of pigment, have also been recognized about the dilated vessels of the papillary portion of the derma.

Etiology.—From what precedes, it is clear that the causes of the chloasmata are both numerous and varied. They include all agents capable of bringing the blood in excess to the surface of the body, from whose coloring matters some of the pigment is derived; and also those which operate from within to produce an excess of pigment, either circumscribed or diffused, upon the surface of the body.

Diagnosis.—The recognition of cutaneous pigment anomalies is exceptionally facile. Vitiligo is distinguished by patches which are commingled with others in which there is a total or almost total absence of pigment. In chloasma the characteristic color of the patch, its failure to disappear under pressure, and the absence of all signs of inflammation such as redness, discharge, desquamation, etc., make its recognition easy. The most important point in connection with the diagnosis of these forms of dyschromia is the recognition of the special causes of each; for example, of that which is due to the action of external causes or of those of internal origin (icterus, bronzing in Addison's disease, etc.). Pigments applied externally to the skin for the purpose of exciting sympathy, as in feigned eruptions, are readily recognized by the ease with which they can be removed from the surface by washing or by chemicals. Stainings of the skin produced by articles of clothing dyed with the popular aniline dyes can usually be recognized without difficulty by the vividness of their coloring in red, blue, etc. The vegetable fungi which result in patches of discoloration upon the skin, such as in *tinea versicolor*, produce almost all the shades of color seen in the various forms of chloasma; but the parasite can be recognized under the microscope with ease in the scales scraped away from the surface; and in all such there is a tendency to exfoliation of small squamæ from the surface of the skin not noted in chloasma.

Prognosis.—The symptomatic chloasmata can occasionally be made to disappear under treatment, but sometimes persist when the cause effective in each case continues to be active. Some of them seem to disappear gradually under the influence of causes which are not thoroughly appreciated. In general, it may be said that the artificial removal of colorations of this sort is accomplished only with difficulty.

Treatment.—The treatment of pigmentations which disappear spontaneously is limited to the simplest measures compatible with the integrity of the skin. The constitutional treatment of all others is that which is specially indicated in each individual case. The indication for local treatment is the removal or destruction of the pigment in the epidermis. This can be accomplished by all measures which entirely remove the

superficial layers of the skin—for example, by blistering or crasion. But a serious objection to applications of this sort is scarcely to be set aside. All processes mechanically or chemically removing the epidermis in whole or in part from the tissue beneath, tend to invite to that part the blood in excess. This produces or tends to produce an increase of pigment after the integrity of the skin is restored. This is well illustrated in the case of the action of a sinapism or blister upon a cutaneous surface. If the pigment be superficially deposited, it is usually removed with the epidermis separated by the action of the vesicant, and when repair is complete the pigmentation seems to be fully or in part removed. Sooner or later, however, it returns, and commonly in excess of that which previously existed. Even upon a healthy and normally pigmented skin the action of a blister in producing an excess of pigment in the part to which it is applied, is perceptible for weeks, and in some cases for months, after the date of the local application. This, consequently, is one of the most serious considerations in the local management of the chloasmata in general.

The articles employed for producing disappearance of pigment from the skin may be enumerated as follows: Corrosive sublimate in solution with almond emulsion, in the benzoin tincture or in simple Cologne water, in the strength of from one to four grains to the ounce, applied several times in a day, is one of the most popular and efficient of topical medicaments. In the weaker strength of from one to two grains to the ounce it is sometimes employed to produce a severer local effect by being kept upon rags in contact with the part. Other articles employed for the same purpose are boric, acetic, carbolic, and muriatic acids; the caustic alkalies; the tincture of iodine; pastes containing sulphur, ammonia, the chloride of mercury, bismuth, and the chloride of zinc; the nitrate of mercury ointment, one part to two or four of simple ointment; the peroxide of hydrogen and the Lassar paste, containing from five to ten or twenty grains of salicylic acid to each ounce. Shampooing the part with the tincture of green soap, followed by the application of a chrysarobin paste, or by weak solutions of the same drug in chloroform, are also recommended. The stronger and more caustic agents advised in cases of this sort should always be used with great caution, and are all especially liable to be followed by the severe increase of pigmentation to which attention is called above. Appended is a series of formulæ selected from those most highly recommended and most commonly employed:

R	Hydrarg. chlorid. corrosiv.	.	.	.	.	.	.	gr. x
	Emulsion amygd.	.	.	.	.	.	.	℥vj
	Benzoin tinct.	.	.	.	.	.	.	3j

M. S.: For external use several times daily.

R	Kaolin.	3 j
	Magnes. carbonat.,	
	Zinc. oxid.	āā 3 ss
	Glycerin.	3 j
	Vaselin.	3 ss

M. S.: External use.

R	Bismuth. chlorid. precip.	3 j
	Baryt. sulph. precip.	3 iv
	Cer. alb.	3 ss
	Ol. amygd. dulc.	3 ij

M. S.: External use.

R	Hydrarg. ammon. muriat.,	
	Bismuth. magister.	āā 3 j
	Ungt. glycerini	3 j

M. S.: To be applied every second night.

[WERTHEIM.]

Argyria.—A discoloration of the skin is produced by the nitrate of silver after its ingestion by the stomach, and also, it is claimed, after its topical use upon the mucous membrane of the eyes, the tonsils, and other parts of the mouth. The coloration is supposably due to the deposit of the oxidized metal in the skin itself. The coloration is in shades of a bluish-gray, dull slate, or even black, found not only upon the exposed but also upon the covered portions of the body, including the mucous membrane, and even upon the lining membranes of some of the viscera. Up to the present time internal and local treatment of this form of dyschromia has been wholly ineffective. Another method of introduction of the metal into the system is that of workers in metallic silver, who are reported to suffer from minute particles of the metal which traverse the epidermis and remain fixed in the corium.

Other medicaments are capable of producing a similar effect. The ingestion of arsenic in some individuals produces a peculiarly dark, diffused, or circumscribed pigmentation, usually of the upper portion of the surface of the body, more particularly the front of the chest, in those who are susceptible to its action. The color is said to disappear slowly after the metal is no longer ingested. Picric acid and certain toxic agents in the form of inhaled gases are also capable of producing cutaneous discoloration.

Tattooing.—The introduction of pigments into portions of the skin by the aid of needles, as in the act of tattooing, produces colorations for the most part in the form of figures intentionally produced. The articles usually selected for this class are the various carbons, with vermilion and indigo. Over a design drawn upon the surface of the skin are introduced needles, usually clasped in a handle made for the purpose, which are made to penetrate the surface to the point of drawing a few drops of

blood. The pigment is subsequently well rubbed into the surface. Fox, of New York, has produced an illustration where tattooing marks of this character became subsequently the seat of warts which developed the figure of an anchor.

The grains of gunpowder which are in some cases driven into the skin by explosion leave persistent discolorations of the surface which strongly suggest marks left by tattooing.

No treatment for any of these colorations after they are once fully formed has ever been in the slightest degree effective. The careful removal with due antiseptic precaution of all grains of gunpowder blown into the skin, if practiced within a brief time after the occurrence of the accident, has often proved successful.

An Anomalous Discoloration of the Skin and Mucous Membrane is described and figured by Marshall Bruce (International Atlas of Rare Skin Diseases, vol. vi, 1891, No. 2, No. 7), in the case of a harness-maker in whom the general surface of the face, hands, feet, and several of the mucous surfaces were involved. The patient complained of intermittent burning and shooting pains in the epigastrium and lumbar regions. At one time the patient had suffered from syphilis. The discoloration strongly resembled that produced by the nitrate of silver or in cyanosis.

Acanthosis Nigricans.—Pollitzer and Janovsky (International Atlas of Rare Skin Diseases, vol. iv, 1892) report the cases of two patients in whom the face, mucous membrane of the mouth, neck, backs of the hands, the fingers, and the axillary and anogenital regions were discolored in bluish-gray or dark brown shades, with a peculiar verrucous outgrowth in some parts, particularly in the groins and armpits. In one of the patients there seemed to be a spontaneous disappearance, and death later from what was supposably cancer. Crocker reports the case of a Swedish sailor who became accidentally pigmented in nearly the same regions, the coloration having no definite line of demarcation. The color varied from a yellowish brown to a blackish hue. In some portions of the body were closely seated, small-sized papillary masses. The natural lines were deepened by the thickening of the discolored parts. There was no exfoliation from the surface. In this case, as distinguished from the first two mentioned, there was no involvement of the mucous membrane nor of the hands.

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KERATOSIS. (JAMES NEVINS HYDE.)

Deriv., Gr., *κέρας*, a horn.

Synonyms: Keratoma; Keratoderma; Lichen.

Statistical frequency in America, 0.083.

Definition.—Keratosis is a term employed to designate a group of disorders characterized for the most part by a transformation of the normal epidermis of the skin into a dense and corneous tissue.

The name keratosis has been employed with a certain degree of looseness in cutaneous medicine, for the designation of disorders several of which exhibit the greatest differences the one from the other. In these pages it is made to include keratosis pilaris, keratosis senilis, keratosis palmaris et plantaris, and keratoangioma.

KERATOSIS PILARIS.

(*Pityriasis pilaris*; *lichen pilaris*.)

Keratosis pilaris is an affection of the skin, chiefly of young and vigorous adults, in which the orifices of the hair-follicles of the thicker portions of the skin are occluded with corneous plugs.

Symptomatology.—The lesions in this disorder are pinhead sized, flat or conical papules, either of the natural hue of the integument or slightly reddened at the contour. Occasionally they have a dirty grayish or blackish appearance in consequence of accumulations occurring upon the surface of the skin. When of the reddish hue named above they are conspicuously not of inflammatory type, and therefore the term lichen pilaris, which was at one time used to designate the disease, has been for this purpose properly abandoned by the best writers.

The papules characteristic of this disorder are each pierced by a hair, which is either of the lanugo type and pointed, or broken off at the top of the lesion and then represented by a dark or blackish point at the apex

of the conical papule. In other cases the hair is coiled within the papule. The skin in the neighborhood may be of perfectly healthy type, or be covered with slight superficial and horny scales such as are seen in so-called xeroderma and ichthyosis.

The papules are found chiefly on the extensor aspect of the extremities, particularly over the outer faces of the upper arm and thigh, where they often project above the surface to such an extent as to produce in the hand passed over the surface the sensation of a nutmeg-grater. The lesions when closely inspected are found to furnish at the point a dry scale, flattened or pointed, which may be either due to a physiological concretion of the exuvium at this point, or to a morbid process. Variations in color are seen from the normal hue of the integument to a rosy pink, a deep red, and often a purplish and violet hue, these colors being representative of different types of skins; those which are either both dense and thick, or, more rarely, those which are of the blonde hue and more delicate. At times the intensity of the color is proportioned to the number and size of the lesions. Brocq calls attention to the fact that in the neighborhood of mature and adult papules one may often discover scattered over the surface whitish points resembling punctate cicatrices. These are points where the papules of keratosis have proceeded to complete involution.

In general, the disorder is not productive of subjective sensations, but occasionally the papules are the seat of considerable itching.

The rarer development of these lesions upon the face is seen, as a rule, only when the other sites of keratosis pilaris are well occupied. When the former region is involved the papules are usually small and conical, penetrated by a downy hair, closely set together, reddish or pallid in hue, and recognized in symmetrical situations, above the eyebrows, beneath the line of the hairs of the scalp as they border upon the brow, at the root of the nose, between the brows, on the lateral portions of the face, particularly at the angle of the jaw, and the preauricular region. These facial lesions are most pronounced when the disease departs from its usual type and approximates the grade of the similar disorder to which the French have given their distinctive name, *pityriasis rubra pilaris*.

Pathology and Morbid Anatomy.—Section of the papules, viewed under the microscope, discloses the fact that the disorder consists practically of a hyperkeratinization of the external portions of the pilosebaceous conduit. The horny masses plug up the outer portion of the duct, producing a pseudo-papule at the orifice of the hair-follicle. In some cases a mechanical congestion of the blood-vessels occurs about the part; and in extreme cases an inflammatory process extends to the gland itself. In rarer instances minute acne pustules can be recognized, capping the papule or intermingling with the rough and horny excrescences

upon the surface of the skin. Where minute cicatrices result they are due to an atrophy of both the pilary and sebaceous crypts.

Etiology.—Attempts have been made to assign to this disorder such causes as scrofula, struma inheritance, and other obscure conditions. It is also by some authors set down as the result of a failure to bathe the skin at proper intervals.

I have, however, long been of the opinion that in its typical expression keratosis pilaris is a sign of unusual physical vigor, and belongs to the category of the physiological rather than of the morbid aberrations from a healthy standard. It is without question more often seen in men and women of brawn and vigor than in the cachectic, and in those who are weak or sickly. In its most marked expression it must be admitted that it is seen in those suffering from other maladies due to hypertrophy of the papillary portions of the derma.

Diagnosis.—The disease is usually recognized by the situation of the papules at the orifices of the hair-follicles, by the appearance of a hair or the stump of a hair at the apex of each, and by the absence of all inflammatory symptoms which might lead to a suspicion of papular eczema or other exudative affection of similar features. The condition known as *cutis anserina*, or “goose-flesh,” is produced by the action of cold upon the surface of the skin, and is always transitory.

The papular lesions of syphilis are easily recognized by their occurrence in other situations than those which are the sites of predilection of keratosis pilaris, and are also recognized without difficulty as symptoms of an infectious disorder. When occurring upon the face, the distinction from rosacea is readily made by the greater number of cases in which the symptoms of the latter disease are displayed about the nose and cheeks.

Prognosis.—This is always favorable. The subjects are usually young and healthy, and, by the employment of proper measures, can commonly be greatly relieved of their symptoms.

Treatment.—Constitutional treatment in these cases is not required. The local treatment is by alkaline and vapor baths, inunctions of green soap with warm baths, and anointing of the surface after such bath with any one of the simple emollient unguents. This latter is the routine treatment laid down in most of the text-books. I have, however, greatly preferred cool salt-and-water sponging of the entire surface of the body daily, followed by the use of the flesh-brush in all cases where the keratosis was of medium grade and not associated with the graver involvement of the skin described above. About one quarter of a pound of common salt is added to each gallon of water, and the temperature of the bath is as cool as is tolerable by the patient, the latter being commonly a young and vigorous adult of either sex. The use of the flesh-brush or coarser towel afterward is productive of a singular smoothness and

marblelike hardness of the skin and commonly removes the disfigurement of which these patients complain. In extreme cases, quinine administered internally is effective in producing, even in moderate doses, a very remarkable smoothness of the skin.

KERATOSIS SENILIS.

In the old age of the skin, side by side with the atrophic changes peculiar to that condition, the keratoses occur in two distinct types. In the first or horny type warty projections develop upon the surface, single or multiple, in the form of a flattish plate, of a dirty yellowish or even brownish color; as also in the form of minute or larger papules, with verrucous apices like those of the common wart—these warty growths being often the first indication of an epitheliomatous change. In the moist forms a peculiar greasiness of the skin is conspicuous, which appears either in the form of an irregularly diffused smearing of the surface, similar to that seen in certain grades of seborrhœa of the skin, or in the form of adherent greasy plates. When the latter are removed, the skin, instead of being anæmic or practically uncolored, presents evidences of congestion. Between these well-marked types of the corneous changes in the skin of the aged occur all variations of harshness and dryness affecting either the face or backs of the hands or feet, or other portions of the extremities. In rare cases the skin of the entire surface of the body, besides being pigmented, harsh, and dry to the touch, is covered with adherent and horny scales of the type described as branny, provided or not with the same greasy secretion recognized in certain disorders of this class upon the face. Intermingled with these more or less characteristic symptoms of keratosis of the skin of the aged, are pigmented points, discolored, yellowish-brown, granular, and warty patches; and in others there is without question a thickening rather than an atrophy of the entire derma, particularly in those of advanced years who are toilers with the hands. In these cases the skin of the back of the hand is often converted into a dense, leathery, and horny case.

The pathology, morbid anatomy, etiology, diagnosis, and treatment of these conditions are practically that of the form of keratosis already described. In the matter of prognosis, however, care should always be taken to guard against the possibility of cancer, which, in the skin of the old man or woman which has become the seat of the changes described, may at times occur.

KERATOSIS PALMARIS ET PLANTARIS.

(*Tylosis Palmæ et Plantæ; Keratoma; Ichthyosis Palmaris et Plantaris.*)

Definition.—In this condition the epithelium of the palms and soles is converted into a dense and horny plate.

Symptomatology.—This is a rare disorder, congenital or acquired, usually symmetrical, and affecting both the palms and soles, sometimes the latter without the former, and occasionally the reverse. It occurs both as a consequence of intermittent pressure, as in the trades and occupations of life (clog-dancers, servants constantly upon the feet, etc.), and also in cases where no such cause can be recognized as efficient. The latter cases constitute a group of disorders which are probably wholly different from the former—the thickenings resulting from pressure in the trades and occupations requiring the use of the hands and feet being properly discussed among the callosities.

When the disease is well marked, the skin of the palm and sole is usually covered with a homogeneous leathery and horny plate or thickening of the epidermis, light yellowish or yellowish gray, sometimes quite dark in hue, exceedingly firm and dense, resembling sole leather, and of the type described by writers as coriaceous. There are three types recognized by Besnier: The first, which is congenital and inherited; the second, or erythematous type, occurring in childhood and supposably associated with a central neurosis; the third and last, developing in isolated and multiple points on the soles of the feet in the region of greatest pressure. The variations from this condition are singularly diverse and polymorphic. The horny plate may extend upward from the sole over the dorsum of the foot, and slightly from the palm to the back of the hand. It is often surrounded at its outer border by a narrow and delicate rosy-tinted halo, due to a passive congestion of the part, and never of inflammatory type. This zone of redness is remarkable for the fact that in some cases both it and the dense coriaceous plates occurring upon the palms and soles, are moistened with a cold secretion, due to a hyperidrosis. This sweating of the hands and feet in connection with the formation of the callous plate occurs in a large proportion of cases. With and without the latter it will be seen that one or several or all of the nails of the hands and feet are thickened, irregular, roughened, and tilted away from the nail-beds by a deposit of masses of heaped-up epidermis visible beneath the free border. In some cases these plates, without the intervention of medical or surgical treatment, are periodically shed and replaced for a longer or shorter time by a normal integument. Systemic symptoms often coexist, the pulse being sometimes exceedingly slow, running in adults from fifty to fifty-five beats in a minute, without other manifest impairment of the general health. In still rarer cases, upon the regions adjacent to the palms and soles, the forearms, ankles, and the legs, there is either an abnormal growth of hair or relative absence of the latter. Brocq describes a further variation in the form of longitudinally directed ribbons or bands running along the central portion of the palmar faces of the fingers. Variations also occur in the visible surface of the

plaques, which may be smooth or present a worm-eaten appearance. The subjective sensations are slight, except when the hands or feet are employed, in which case there may be extreme sensitiveness to pressure, and when the feet are involved sometimes locomotion is impossible.

Pathology and Morbid Anatomy.—The seat of these metamorphoses does not exhibit characteristic features different from those recognized in callosities. In the central nervous system the changes must be sought which are responsible for the eccentric phenomena.

Etiology.—The causes of this condition are ill recognized. It has been thought that in some cases of the acquired form the ingestion of arsenic was responsible for the disorder. Many cases are congenital, and that in both sexes, though but one sex may be affected in several children of one family. It has been traced through several generations, and has in cases been complicated by the development of warts in the sites where the disorder has prevailed.

Cases of minor significance are constantly occurring where the palms and soles are thickened as the result of inflammatory changes due to such diseases as eczema, syphilis, and lichen planus. The disorders termed keratoderma, and erythema keratodes are variations from the type described above.

Diagnosis.—True symmetrical keratosis of the soles and palms, as distinguished from the complications of eczema, psoriasis, etc., is recognized by the entire absence of the signs of inflammation. The skin, even though reddened at the border of the patch, is usually cold, and either dry or bathed in perspiration. The lesions of the palms and soles in syphilis are readily distinguished, even when horny masses form, by the rounded, discrete patches, and the destructive character of the process at the points of involvement.

Prognosis.—The prognosis in most cases is favorable, prolonged and persistent treatment being followed by the desired results. In many cases even the most obstinate forms are spontaneously relieved. The disease is, however, under the most favorable circumstances exceedingly obstinate and rebellious to treatment, requiring always long periods of time for its amelioration.

Treatment.—The internal administration of arsenic in large doses, and particularly the arseniate of sodium, as recommended by Brocq, has been repeatedly tried. I have not seen any decided advantage from the internal administration of any remedy in these cases. The general treatment of the patient should always be conducted by the aid of a generous diet, and by alcoholic or salt-and-water stimulation of the entire surface of the spine daily, followed by vigorous friction. The callous portions of the skin are to be soaked in an oleaginous fluid and then removed by the use of green soap and hot water. After the removal of the dense plates

the surface may be stimulated by frequent shampooing with soap and water, followed by mercurial or lead plasters; or by painting a ten-per-cent. solution of salicylic acid in ether over the surface, as recommended by Unna. Other measures employed for softening and removing the leathery masses from the palms and soles are poultices, fomentations with rubber covering, frequent baths, plasters of green soap and mercury, and applications (in the form of plaster or unguent) of pyrogallic acid, resorcin, and the caustics.

KERATOANGIOMA.

Mibelli (*Giorn. Ital. d. Malatt. Ven. e. d. pelle*, F. 3, 1889) and Thibierge (*Annales de Dermatol. et de Syphiligr.*, November, 1892, tome iii) describe lesions occurring on the dorsal surface of the fingers in the form of translucent, hempseed-sized, globoid tumors of the color of lead and darker, with a rough and sometimes prickly surface. These were of horny consistence, and between them were scattered small spots of the size of a grain of corn, darker at the center than at the periphery. The epidermis covering them was horny and hard, but smooth and without scales. Transitional forms, between the spots and the tumors, were in one of these cases observed; in another, the lesions were decidedly of the type of varicose dilatations of small vessels in the nose coinciding with lesions of the hands resembling those occurring in chilblains of those parts, and local asphyxia attributed to the same causes as those productive of the lesions in the other case. Crocker, Cottle, Zeisler, and others have reported similar instances, the lesions usually developing as chilblains, commonly in the winter season, discrete, sometimes irregularly grouped, often distinctly elevated above the surface and intermingled with wartlike papules, none having the slightest tendency to spontaneous involution. In one case the ears were affected; in others the palmar and plantar surfaces were slightly involved.

Pathology and Morbid Anatomy.—The disease is due to inflammation products involving the blood-vessels and connective tissue of the corium. In the upper portion of the latter, infiltration with leucocytes has been recognized; and in Mibelli's case the lymph spaces were thought to be dilated. The epidermis is in all cases considerably thickened; the intercellular spaces are filled with blood and irregularly outlined.

Etiology.—The patients have been usually young subjects, the disease dating from an early period of life. They are commonly subject to chilblains, the lesions of the hands often following exposure to severe cold weather.

Prognosis.—Without treatment there is no tendency to spontaneous involution.

Treatment.—The vascular dilatations may be destroyed by the elec-

trical needle, as in the operation for the permanent removal of hairs in hirsuties. The general treatment, aside from destruction of the blood-vessels, is by brisk stimulation of the surface of the skin by shampooing with alcoholic solutions of soap, and by the subsequent application of lead and soothing plasters.

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CALLOSITAS. (JAMES NEVINS HYDE.)

Deriv., Lat. *callus*, dense skin.

Synonyms: Callosity; Tylosis; Tyloma; Callus; Keratoma; Fr., *Durillon*; Ger., *Verhartung*.

Statistical frequency in America, 0.090.

Definition.—Callosities are corneous plates formed over the derma, composed of hypertrophied masses of epidermis, produced in portions of the body exposed to intermittent pressure.

Symptomatology.—Callosities occur in both congenital and acquired forms, the latter very much the more frequently encountered. They are found chiefly upon the surface of the palms and soles where there is intermittent pressure, and especially where the integument is stretched over bony prominences. They may result as a consequence of either intermittent pressure, or of the action of chemical or other irritants upon the surface. Those limited to the soles of the feet are usually seen in the neighborhood of the heels and about the toes, in consequence of the pressure of ill-fitting shoes. Other well-known thickenings occur in the various trades and occupations of life, chiefly about the hands; as, for example, in the case of smiths, oarsmen, players upon musical instruments, and wheelmen of vessels. Callosities of this class also occur in regions where the skin is unduly pressed by hernial trusses, corsets, and apparatus intended to supply the place of a missing member. Their seat and extent depend largely upon the cause operative in each case. They are usually dense and thick; and in hue either yellowish or discolored in shades of gray and black, particularly in the regions of the palms.

As a rule, when the organ which is the seat of the callosity is disused, the thickening spontaneously disappears, leaving the surface soft, pliable, and practically in a normal condition. At times an inflammatory process occurs beneath or about the callosity, in which case the latter becomes tender and painful, and is occasionally superimposed upon a purulent deposit in the true skin beneath the epidermis. In still other rare cases it

becomes the seat of erysipelatous inflammation, or an involvement of the lymphatic vessels, and in more extreme cases of a gangrenous slough. The callosities found irrespective of pressure and chemical effects in the palms and soles are usually symmetrical, and are to be referred to the class heretofore described of the keratoses of the palms and soles.

Pathology and Morbid Anatomy.—On section of the skin, callosities are recognized as due merely to thickening of the epidermis and the multiplication of the cells which compose it. Beneath the thickenings in many cases there is a hyperæmia of the superior portion of the derma, more particularly of its papillary layer, which may result in the accidents described above.

Etiology.—The cause of the thickenings here described is invariably a conservative attempt on the part of the system to protect the sensitive skin from the consequences of intermittent pressure. Persistent pressure upon any one portion of the integument results invariably in softening of the tissue, which finally produces an ulcer. It is the intermittence of the pressure which permits the reactive effect in the thickening and its protective influence.

Diagnosis.—The recognition of tylosis is always easy when the corneous deposit forms over the surface of the skin which is the seat of pressure. Situated upon the palms of the hands and soles of the feet, these thickenings are to be distinguished from syphilitic changes of the same region. The latter, however, by no means occur in the regions of greatest pressure, but are apt to be found in the hollow of the palm, as distinguished from the thicker skin over the smaller joints. The syphilodermata also are apt to ulcerate, or, if not that, to be the seat of fissures or an exfoliation, leaving losses of tissue which are never recognized in a keratosis of these regions. Morison, of Baltimore, has reported an interesting case in a negro stoker upon whose fingers occurred callosities, beneath which degeneration of the skin occurred, and finally a loss of some of the phalanges of the digits. Cases of this extreme character require to be differentiated from the mutilation of lepra and from “perforating disease of the foot.” Callosities are to be carefully distinguished from the symmetrical keratoses due in most cases to a central neurosis.

Prognosis.—The prognosis of all cases is favorable. The removal of the cause is promptly followed by disappearance of the thickening, and, short of that, by the intervention of the surgeon or physician, the callosity may be removed.

Treatment.—In many cases no treatment of callosities is demanded, the thickening being useful in the prosecution of the work of the laborer; as, for example, the thickening of the lip of the flute-player, which is essential to the accuracy and clearness of his notes, and those which are found on the hand of the tailor who plies the shears in his trade. When

hard corns and callosities, especially when ill-treated, may lead to erysipelas, suppuration, and even to ulcerative changes in the tissue beneath.

Pathology and Morbid Anatomy.—Corns are callosities with an outward projection, due to a hypertrophy of the horny layers of the epidermis and consequent hyperæmia, with cell infiltration of the derma pressed upon by the inferior portion of the projecting mass. Minute hæmorrhages sometimes occur beneath corns, and in extreme cases a bursa forms below them.

The etiology, diagnosis, and prognosis of corns are those of keratosis and callositas.

Treatment.—Corns invariably disappear when the pressure which produced them is removed. In cases of fracture of the lower extremities, where the limbs are long disused, as also in cases of paralysis of the lower limbs, corns spontaneously fall. The disuse of improperly fitted boots and shoes usually results in the disappearance of the clavus.

The corn itself may be either removed, destroyed, or rendered innocuous by different methods. It is commonly first well soaked in hot water, and then closely shaved, and protected with the rings of plaster which are sold in the shops. In the center of these annular plasters may well be placed a soft mass of emollient ointment. In other cases, after the soaking and paring off of the thickened portion of the epidermis, the part is thoroughly covered with superimposed layers of rubber or lead plaster, which, when properly applied, operate by the distribution of pressure over the sensitive part of the derma pressed upon by the peg projecting from the under surface of the corn. Other articles employed for this purpose are plasters of salicylic acid, ointments of the nitrate of mercury, and solutions of caustic potash. Most of the "corn cures" sold in the shops contain modifications of the well-known formula: salicylic acid, ten to twenty grains; extract of cannabis Indica, half a scruple; alcohol and ether, each twenty drops; and sufficient flexile collodion to make one ounce. The popular "*papiers*" found in the market probably depend for their usefulness upon the presence of salicylic acid. Soft corns usually require the same treatment, but at times need to be penciled with the nitrate of silver after the thickened cuticle has been softened and pared away.

CORNU CUTANEUM. (JAMES NEVINS HYDE.)

Deriv., Lat., *cornu*, a horn.

Synonyms: Cutaneous Horn; Fr., Corne de la peau; Ger., Hauthorn; Hornauswuchs.

Statistical frequency in America, 0.034.

Definition.—Horns are cutaneous outgrowths which in their general shape, exterior roughness, color, and consistence strongly resemble those occurring in the lower animals.

Symptomatology.—Horns are usually implanted upon the surface of the skin from which they grow by one or several attachments. They differ markedly from those of the lower animals in that the former are seated in the skin and not upon the bone. They are usually single, but may be multiple, and in rare cases occur in large numbers upon the surface of the body. In general they remotely resemble the horns of the lower animals, but are neither symmetrical, uniform, cylindrical, nor conical, but usually of a dirty-yellowish, brownish, or blackish hue, firm or granular, dry, and often laminated. They have an occasional twist, and often an ill-defined point at the distal extremity; sometimes they are twisted or bent at an angle, or irregularly ribbed and corded. They vary in length from the width of half a finger nail to several inches. The rare exceptions noted in the works devoted to this subject are horns of unusual length and thickness, which may even be branched in such a manner as to remotely resemble antlers. They occur upon the scalp, the forehead, the temples, the nose, the genital regions of the male (particularly the balano-preputial fold), the trunk, and the extremities. They are seldom the seat of any subjective sensation. When the seat of injury, they usually exhibit an inflammatory process at the point of their origin. If removed by accidental fracture, they leave a reddish surface beneath, from which it is said there may be a reproduction of the growth. At times they fall spontaneously, and recur at the same spot. They may be the starting point of an epithelioma. According to Lebart, this complication occurs in about twelve per cent. of all cases.

Pathology and Morbid Anatomy.—On section, horns are recognized as simply warty growths which have undergone corneous transformation. Their seat is in the mucous layer of the epidermis, where at the site of origin the rete cells are multiplied and rest upon hypertrophied papillæ of the corium. Horns, on section, are seen to be composed of more or less concentrically disposed epidermal cells, generally not provided with nuclei, and fastened together by a cement substance which is an exaggerated likeness of that surrounding the epithelia of the normal rete. At times a horn is found to have its base implanted in one of the cutaneous follicles, in which event the epithelial lining of the duct of the gland has an active part in its production.

Etiology.—Horns are rather more frequent in women than in men, and occur rarely before middle life, almost always in advanced years, though they have been noted as of occurrence in all ages. They may have their origin in pre-existing cutaneous lesions, such as seborrhœic disorders (cysts), warts, keratoses, and cicatrices.

Treatment.—Horns should be softened with hot borated fomentations and then removed by scraping or paring, after which the base should be curetted and treated with aseptic powders. In some cases the

base requires to be cauterized with the nitrate of silver, caustic potash, or chloride of zinc paste. If the base be not thoroughly curetted there may be recurrence of the growth. When originating in cysts, the latter may be either enucleated or dissected out, the larger growths, especially of the penis of the male, requiring surgical ablation.

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VERRUCA. (JAMES NEVINS HYDE.)

Deriv., Lat., verruca, wart.

Synonyms: Wart; Fr., Verrue; Ger., Wartze.

Statistical frequency in America, 1'09.

Definition.—Warts are congenital or acquired excrescences, moist or dry, single or multiple, varying greatly in size, shape, color, and structure.

Symptomatology.—The several names which have been given to the different clinical forms of warts are chiefly valuable in the way of designating the type of growth in each case. These lesions, however, may be regarded as simply variants of an overgrowth of the epidermis in different anatomical situations, with resulting differences in color, shape, size, secretion, and morbid tendencies.

They are alike in their essential characteristics; all are excrescences, elevated from the surface, single or multiple, hard or soft, mammillated, tufted, club-shaped, or with the usual irregular and roughened surface to which the title “warty” is commonly applied.

Verruca vulgaris is the common variety of wart usually suggested by this term. It is of the class described as juvenile, occurring for the most part in children during the years following the first dentition.

The lesions are pinhead to pea-sized and larger, firm, rugous, sessile, conical, flattish, or blunt-pointed elevations; commonly limited to the hands, chiefly the fingers, and undoubtedly occurring in these regions as the result of contact with the special causes of the disorder. They may exist, however, on any part of the surface.

Carefully inspected, they are seen to be at the surface either smooth or mammillated (beset with minute roundish projections), each point of projection representing the apex of a single verrucous excrescence. In color they vary from the normal hue of the integument to a dirty-yellowish, grayish, or blackish tint. They are single or very numerous, isolated or very closely set together, and are in some cases almost symmetrical in distribution. As a rule, the more they are deeply tinted and rugous, the older their development.

Verruca acquisita points to the acquired wart as distinguished from **verruca congenita**, recognized on the surface at birth. The latter are often displayed in lines suggesting the influence of the nervous system in the areas of their distribution.

Verruca perstans, a persistent growth, differs from the **verruca caducea**, which spontaneously falls after completion of a period of evolution.

Verruca plana describes a not uncommon variety of wart, pinhead to coin-sized and larger, single, or multiple and numerous, occurring on the

face, hands, trunk, and other regions of individuals who are either young or middle-aged. They may be slightly elevated, but are usually flattish and rugous, being whitish or yellowish-white in color, disseminated or irregularly grouped, and but little sensitive to pressure.

Verruca glabra, a smooth variety, is also found under the same conditions.

Verruca mammillata (*acrothymion*) relates to the irregular lobulations, elevations, and fissures visible upon the surface of some of these forms.

Verruca filiformis describes a slender, sessile wart pointed at the free extremity, and one or two millimetres in length, occurring upon the face, neck, and shoulders of persons of adult years. They may be single, multiple, and grouped, or irregularly arranged; more often the first. In a few instances they are congenital.

Verruca digitata is a fingerlike, usually lobulated growth, separable into masses. It is seen upon the scalp, but often in numbers upon the back and shoulders, whitish, reddish, yellowish, or more deeply pigmented. Besnier and Doyon make a useful division of warts into those of youth (period of growth), those of adult life, and those of old age. In the first class they place *verruca vulgaris*, the common form, an angiomatous form (see *angiokeratosis*, of this volume), and *verruca plana*. In the second class are named *papillome corné*, a variety of wart most often encountered in laborers with the hands (I have seen it, however, in several cases occurring in young women who rarely used the hands except for the diversions of lives of leisure), where a dense, linear, warty growth occurs at the borders of the nail, particularly about the thumb, which at times perceptibly loosens the union of the nail with the digit. Lastly, the senile wart.

Verruca senilis (*keratosis pigmentosa*) is seen on the trunk, the hands and the arms, the face and the neck of persons of advanced years, pure as to type, or commingled with other indications of the senile condition of the skin, and even with the early symptoms of an epitheliomatous change. They may be the seat of a considerable pruritus; are usually flattish; may be single or multiple, but very rarely grouped; and may represent the normal color of the skin, or be dirty yellowish, brownish, or even blackish in color. They may be flat, elevated, "papillomatous," secreting a fatty substance, firm, softish, or the seat of an enormous proliferation, exhibiting in different parts several of the peculiarities of warts in general. The *seborrhæic wart* is of this class.

Verruca necrogenica (*anatomical tubercle*) is encountered on the hands chiefly, but also elsewhere, of those engaged in handling the bodies of the dead (post-mortem examiners, undertakers, prosectors, and others engaged in anatomical study), as also of persons exposed to the efficient causes of the disorder. These lesions are now recognized as due to infec-

tion with tubercle bacilli, and are properly discussed among the tuberculoses of the skin.

Verruca acuminata (condyloma acuminata; venereal wart; moist, fig-pointed wart; Fr., poireaux; végétations dermiques; Ger., Spitzwarzen; Spitzencondylome; Feigwarzen). These are filiform, club-shaped, tufted, sessile or pedunculated, single or multiple, and, in the latter event, isolated or closely aggregated excrescences. The fanciful names given to them are suggested by the variety of their clinical forms, as a consequence of which they have been likened to the fig, the mulberry, the cauliflower, the comb of a cock, and the cabbage. They vary in size from pin-point to masses as large as the two fists, and develop either with great rapidity or slowly. Their most common situations are about the frænum of the penis, the balano-preputial sac, the anus, the vulva, the perinæum in both sexes, the mamma, the toes, and about the mouth and the cheeks. When occurring over the free surface of the skin they may have the natural color of the latter, but when subjected to friction by apposition with either mucous or cutaneous tissue, and especially when in regions of heat and moisture, they become covered with a yellowish-white puriform mucus which has an offensive and very characteristic odor. When this secretion is wiped from the surface there is exposed a vividly red, florid, and tufted growth which is readily made to bleed. At other times they cover themselves with a desiccated, firm, and almost horny substance, which may be the envelope or centers of purulent and other accumulations. They occur with decidedly greater frequency among the young, the fleshy, and those whose parts are moistened with the secretions of an irritative or venereal character (leucorrhœal, blennorrhagic, syphilitic, etc.). They grow very rapidly in pregnant women. After reaching the average size of a cherry or pigeon's egg and persisting for a variable period of time, when not previously removed they usually disappear. It is only in exceptional cases that the larger masses form, and then most often upon the penis or vulva.

Pathology and Morbid Anatomy.—The anatomical formation of all warts is the same. At the foundation lie one or several vascular loops filling the larger part of one or more of the vascular papillæ of the corium, as a pathological consequence of an abundant proliferation of the mucous layer of the epidermis. The primary process is somewhat analogous to that observed in benign epithelioma. The mucous layer of the epidermis, as it increases in thickness, pushes both outward and inward, the soft mass of the outer portion of the wart being due to failure of the hornmaking process in the stratum lucidum and granular layer. Cocci have been recognized in the mucous layer of the epidermis. The micro-organisms, however, which are most effectively present in

lesions of a verrucous order, occur unquestionably in the pointed warts. The parasites which Darier and others have lately assumed to be the factors in the production of some varieties of warts, psorosperms of the family of the coccidiæ, have lately been shown to be modifications of the epithelial cells, some of them manifestly the resultant of the fluids employed in staining sections. By Gram's method a large number of cocci and bacilli have been recognized in ordinary warts of the hands whose pathological importance is as yet undetermined.

Etiology.—Persons of all ages and both sexes exhibit verrucous lesions, but they occur chiefly in children and young adults. The question of their contagiousness has been undetermined until within a recent date. The popular belief upon this subject was in advance of the scientific position of the present day. There is no question now but that in most of these lesions there are micro-organisms which, under favorable circumstances, are capable of inoculation and often of auto-inoculation. The fact that one variety of wart—the anatomical tubercle—has already been set aside from others as due to a cutaneous tuberculosis, possesses in this connection a remarkable significance. Unna's "*flora dermatologica*," a variety of mucors, and a number of the vegetable fungi, unquestionably flourish upon such favorable ground; no more prolific culture field being offered upon the skin than within the mass and upon the surface of vegetations of this character.

Venereal warts are unquestionably contagious, being produced by discharges which themselves are capable of transmission from infected to healthy individuals.

Diagnosis.—The diagnosis of warts is usually made with great readiness. It is important to recognize venereal warts from all varieties of local infectious disease (chancres, mucous patches, gummata of syphilis, etc.), and also to differentiate from the simpler varieties, lesions due to tuberculosis, which in some instances have been the origin of generalized infection. I have elsewhere (*A Practical Treatise on Diseases of the Skin*, Philadelphia, 1893) called attention to a verrucous growth which differs somewhat from the form described above. It is a warty-looking mass, usually of the size of a split pea, occurring on or near the small joints of the digits, chiefly the fingers, and which contains synovial fluid. When punctured, a lucid or yellowish sirupy fluid exudes, and when carefully explored its source is discovered to be a neighboring bursa.

Prognosis.—The prognosis of warts is in general favorable. Reserve must be made, however, in the case of all lesions which are likely to develop on the one hand in the direction of an epithelioma, or on the other in a general tuberculous infection.

Treatment.—The internal treatment of warts by repeated doses (from two to five grains in children, and from ten to thirty or forty in

adults) of the sulphate of magnesium has lately been advocated by several writers. Crocker believes that doses of nitromuriatic acid have been of some service. Arsenic has also been employed with the same end in view. The local treatment is for most cases sufficiently simple. Warts are best removed by the dermal curette, after which the site may be touched with nitrate of silver, salicylic or carbolic acids, chromic acid, or the ethylate of sodium. The acid nitrate of mercury, saturated solutions of salicylic acid in alcohol, and solutions of the same in collodium or gutta percha, as in the "corn cure" described in the treatment of corns, are also useful. The caustic alkalies and the caustic acids have been used with the same result.

The threadlike or finger-shaped warts may be excised with a pair of scissors curved on the flat, and dusted afterward with powdered tannic acid, or touched with a crayon of the nitrate of silver. The pointed warts in the same way may be cut away with curved scissors, the base thoroughly cauterized, and astringent lotions afterward employed containing the acetate of lead, the perchloride of iron, or other astringents. After removal, the part should be for some time stimulated daily with soap-and-water washings, borated or alcoholic lotions, and powdered with tannic acid, boric acid, euophen, or hydronaphthol.

Electrolysis is useful in cases where there is a decided tendency to the reformation of the growth. The *écraseur* may be required for the larger tumors, and in those of the very largest size the intervention of the surgeon is required. Chromic, nitric, and acetic acids are useful in some of the smaller lesions which resist the action of the milder caustics. Warts occurring in women during pregnancy do not require removal by operative procedures until after childbirth. After washing of the parts these should be kept constantly dry, and powdered with iodol or boric acid. In some cases they disappear spontaneously after pregnancy is concluded. Soft warts of the same character forming in the mouth, particularly after the wearing of plates supporting false teeth in the lower jaw, all demand a modification of the plate, which is usually the cause of the growth.

PAPILLOMA CUTIS. (JAMES NEVINS HYDE.)

Deriv., Lat., *papilla*, a papule.

Definition.—The term papilloma is no longer employed by the best writers to designate a cutaneous affection. It relates solely to one of the consecutive, so-called "secondary," lesions of the skin and subcutaneous tissue. It is descriptive of a morbid growth larger than a tubercle, and as a rule smaller than lesions to which the name tumor is commonly given; irregularly shaped or rounded; firm or soft; simple or compound



PAPILLOMA (Hyde).

and lobulated; at times exhibiting a warty or cauliflowerlike external appearance; and, in general, well projected from the level of the integument.

Lesions of this sort in the field of cutaneous medicine are to be classed with the hypertrophies of the papillary layer of the derma. They occur as the sole manifestations of disease, or, more commonly, as an expression of several and different disorders.

Secondary papillomata appear in mycosis fungoides, where they develop with characteristic and classical features. They are also seen as the direct results of syphilis (especially over the scalp), of lepra, of elephantiasis, and of some of the tropical disorders of the skin, such as pian ruboides.

Papillomata occur in purest type as the result of the ingestion of medicaments, including chiefly the iodine and bromine compounds. In most of these cases the subjects are either infants, children, or young adults with exceedingly tender skins. The picture presented in most of these is highly confusing, large egg-sized tumors forming chiefly upon the face and scalp, though also elsewhere upon the bodily surface, at times secreting, at others exhibiting numerous puriform sub-epidermic points covered with a thin roof. Beigel's *papilloma area elevatum* is of this class. The author has described and pictured an illustration of these artificial tuberoso lesions due to the ingestion of the iodide of potassium.

The *neuropathic papillomata* of authors is a variety of nævi unius lateris, or warty growths, not very rarely encountered, distributed in bands or along the areas of distribution of certain of the cutaneous nerves. Morrow's remarkable case of papilloma was of tuberculous origin. Hardaway, with excellent reason, believes that the growth in his well-known case, and some other of the lesions described under this title, result from precedent inflammatory or ulcerative phenomena. The *papillomes cornés* of certain French writers, are the warty lesions described elsewhere as of occurrence along the sides of the nails in hand-laborers and others of adult years.

Brocq, lastly, under the title *papillomatose généralisée des cachectiques*, describes a papillary hyperkeratosis and hypertrophy of the skin in cachectic subjects, occurring in all regions, but particularly noticeable about the folds of the articulations, which become the seat of numerous minute, conical, yellowish or brownish and projecting papules.

Diverse as are the several disorders included under this vague term, it is evident that in all the process is one of connective tissue and vascular hypertrophy, with the formation of an outer envelope, made up for the most part of proliferating epithelium, which may go on to the production of vegetating masses, or to the formation of a dry and horny covering.

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NÆVUS PIGMENTOSUS. (JAMES NEVINS HYDE.)

Deriv., Lat. *nævus*, mole, probably from *gonevus*, born, produced; and *pigmentosus*, colored, from *pingere*, to paint.

Synonyms: Pigmentary Mole; Nævus Spilus; Fr., Nævus Pigmentaire; Ger., Fleck-enmal; Pigmental.

Statistical frequency in America, 0·064.

Definition.—Pigmentary nævi are congenital pigmentary alterations in the skin, usually circumscribed, often accompanying hypertrophies of other constituents of the skin, and usually provided with a growth of hair.

Symptomatology.—Moles differ chiefly with respect to the amount of pigment which they contain, the growth of hairs or the absence of the latter from the surface, and the color which they display, for the most part in consequence of the two factors named above. They vary in size from a pinhead to a large bean, and in color from the most delicate fawn to the deepest chocolate and black. They have been supposed by some authors to be really not of congenital origin, because of their manifest development at periods of time considerably removed from birth. In every case, however, the rudiment of the mole exists before it becomes apparent to the eye, the hue of the mole and the hairs which it may develop being conspicuous only after a certain period has elapsed. Several varieties of moles are described: *nævus spilus*, where there is simply an undue coloration of pigment in the tissue without other manifest altera-

tion; **nævus verrucosus**, where the surface is rough, irregular, and at times lobulated, somewhat resembling the surface of an ordinary wart; **nævus pilosus**, where the lesion is covered with one or many downy and fine or exceedingly coarse and long dark hairs; **nævus papillomatosus**, where the mass of the mole has a soft consistency like that of the tumors seen in mycosis fungoides; and **nævus lipomatodes**, where there is a true tumor formation, with fat, fibrous, and connective tissue, often coexisting with some of the other varieties of nævus above described. "White moles" are simply growths similar to those above described, relatively destitute of pigment.

The regions involved are the scalp, face, neck, trunk, genital regions, thighs, extremities, hands, and feet, the order of frequency being nearly that here given. They occur as single, or, with enormous distribution, as multiple lesions over several regions of the body. In a few cases they are recognized in the areas of distribution of certain of the cutaneous nerves, extending at times over one side of the trunk, as the lesions of herpes zoster are arranged upon one side of the body in the areas supplied with the intercostal nerves. In all those acknowledging the influence of the nerves in their distribution, the moles are, as a rule, uniformly small or medium-sized, and less distinctly pigmented than when occurring singly or in small number in one definite region of the body. At times the secretion from moles is exceedingly offensive, and when irritated they may be the origin of a number of malignant growths, including carcinoma and sarcoma. When occurring upon the palms and soles, moles of this class may be complicated with corns and callosities.

Pathology and Morbid Anatomy.—Moles are colorations of pigment in the mucous layer of the epidermis, together with a new growth of connective, fibrous, or fat tissue. When hairs are produced, the hair-follicle is similar in anatomical peculiarities to those of the normally pigmented regions of the body.

Treatment.—Moles can be removed by the dermal curette when of small size, or by electrolysis. They may also be excised by surgical procedure, or be destroyed by caustics penetrating not lower than the papillary layer of the corium. It is often a nice question to decide between the disfigurement left by a removal of these marks by knife or caustic, and the uncomeliness of the mole itself when not of unusual size. In many cases it is wise for the physician to refuse operation, as the disadvantage of the scar is greater than that of the disorder which it is sought to relieve. The permanent removal of hairs from the surface of moles is in most cases to be recommended; and this can be very effectively accomplished by the methods described in the treatment of hirsuties, by electrolysis.

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ICHTHYOSIS. (JAMES NEVINS HYDE.)

Deriv., Gr., *ἰχθύς*, fish.

Synonyms: Fish-skin Disease; Xeroderma Ichthyoides; Fr., Ichthyose; Ger., Fischschuppenkrankheit.

Statistical frequency in America, 0.249.

Definition.—Ichthyosis is a congenital cutaneous deformity, with features more pronounced as the maturity of the body is reached, characterized by dryness, roughness, and scaling of the epidermis, and in some cases by verrucous growths from the cutaneous surface.

There are three clinical types of this affection which are distinguished from each other by tolerably definite limits: xerosis, ichthyosis simplex, and ichthyosis hystrix.

Symptomatology.—(a) **Xerosis** (xeroderma). This is the most common form of the disorder, and at the same time that which exhibits the least conspicuous symptoms of the disease. It is by some authors separately described, and for reasons which are worthy of consideration. The child about to exhibit the other forms of ichthyosis will often do so at an early period of life; while the young xerotic patient may continue through life to exhibit, perhaps in a more marked degree but always with the same character, the symptoms of the milder grade. It is rare also to recognize a metamorphosis in any one subject of the symptoms of xerosis to those of ichthyosis.

The skin in this condition presents the appearance of that which is unwashed, being dry, roughened, and less extensible than usual, with a loss of suppleness, and a very distinct absence of the greasy feeling of a well-anointed skin. The scales which form upon the surface are usually fine, tolerably well adherent, and slightly turned up on the edge, so that in outline the roughness of the skin is perceptible to the eye. The affection is very slightly marked, as a rule, over the temples and the cheeks, and much more distinctly seen upon the extensor surface of the extremities, about the buttocks, and in the regions of the back of the hand and foot. In well-marked cases there is a distinct *keratosis pilaris*, especially on the outer faces of the thighs and upper arms, where the hair-follicles are seen to be prominent, constituting papules with a scaly cap, each pierced by a downy hair. The condition is, as a rule, much worse in winter and in early life, but almost inappreciable during the summer season. Later, however, there is throughout the hot season an amelioration of the general roughness of the skin, which persists from the beginning to the end of the year. Xerosis, while it may never proceed to the extreme condition described below, usually becomes much more accentuated in middle life, and as a congenital condition never wholly disappears.

(b) **Ichthyosis Simplex.**—In this condition the skin soon after birth assumes a rough appearance, which is succeeded by the formation of large tessellated and delicately marked scales, more or less firmly adherent to the surface of the skin, and not freely removed by friction and transient contacts, as in the proper scaling diseases of the skin. The surface of the integument soon becomes in this way marked by irregular lines with polyhedral interspaces, the appearance strongly suggesting that of a tiled pavement, the interspaces represented by the scales being at first of a dull white, or dead-white color, and, later, dark, dirty-looking, and sometimes almost blackish. As in xerosis, these conditions are always exaggerated in the regions of pressure and friction—for example, about the elbows and knees, upon the extensor faces of the limbs in general, and about the buttocks and shoulders. As in xerosis, too, the milder grades are recognized in early life, and those which are severer in proportion as the maturity of the body is reached. Here, also, the disease is usually aggravated in cold climates and cold seasons of the year, and especially in early life, but ameliorated when the season is warmer. When adult years, however, are attained, a maximum condition of scaliness of the surface with exceeding roughness, and the failure of the production to any appreciable extent of sweat and sebaceous material, becomes more marked. The hair is usually lusterless, dry, and poorly anointed with its natural unguent; in severe cases the eyelids are everted. In consequence of the thickening of the skin of the face, especially in cold weather, the appearance is at times that of an erythematous eczema of the same region, the

blood-vessels showing where the tissue is cracked or fissured. Skins thus involved are in fact often the seat of intercurrent disorders of this character, in consequence of exposure of the surface to the ordinary causes of an inflammation of the skin. The surface is at times the seat of extraordinary and severe subjective sensations, including itching and a sense of soreness and local distress; while at other times, and especially in mild cases, there is no complaint of this kind. Ichthyotic patients are also found who tolerate well the cold weather of the winter, and suffer to an extreme degree in hot weather, probably on account of the failure of the sweat in reduction of the bodily temperature. These patients, however, are marked exceptions to the rule. The regions least involved in the fish-skin disorder, such as the soft parts about the flexor aspects of the joints and the regions of the neck, may exhibit some evidence of cutaneous sweating.

There are authors who still employ to a greater or less extent the following titles in describing the features of ichthyosis. As the latter point for the most part to accidental clinical features displayed in different cases, they should all be abandoned, in the interest of simplicity.

Ichthyosis nitida (nacréé, of Alibert) describes a shining and translucent appearance produced by the scales in some individuals. *Ichthyosis nigricans* points to a condition, not rarely encountered, where the plates covering the derma assume a dark yellowish-green or even blackish hue. Where the scales have a tendency to assume the shield-shaped outline, Schönlein described the condition as one of *ichthyosis scutellata*. *Ichthyosis sauroderma* relates to epidermal plates which are so dense that they suggest the crocodile's hide; and a resemblance to the skin of the serpent gave rise to the term *ichthyosis serpentina*. *Ichthyosis congenita* should be abandoned with the other titles given here, inasmuch as all cases of the disease are congenital, though in some to which the term has been applied, the conditions are more manifest at an earlier date after birth.

Ichthyosis sebacea (also termed by some *ichthyosis congenita, cutis testacea, ichthyosis fœtale*) occupies a debatable ground in the list given. By some authors, with Kaposi, the term is employed to designate infants introduced into the world with a skin cased in a dense envelope made up of an incrustation of sebaceous material, removable without great difficulty, the disorder being curable by the methods employed for the relief of seborrhœic affections in general. By others—more particularly English and French observers—the name is given to a malignant intra-uterine generalized cutaneous hyperkeratosis, rendering the newborn infant wholly incapable of seizing the nipple and surviving. As a rule these monsters exhibit marked cranial defects, ectropion, and grave deformities of the eyes, nares, ears, mouth, and ano-genital orifices.

PLATE XII.



ICHTHYOSIS (Morrow).

Ichthyosis localis refers to a spurious ichthyosis, a condition in which there is a keratoma of some portion of the surface, not of the nature of the disease here considered. The *ichthyosis linearis neuropathica* of Koren (Sep. Afr. N. Mag., f. Læg. 9, Kristiania, 1889) relates to congenital nævi, and not to ichthyosis.

Acquired ichthyosis is described as of occurrence by some authors, but is probably a spurious form of the disease. The disorder is one which is really congenital, and though appearing in type only some time after birth, the foundation of the disorder is manifestly to be sought in prenatal conditions. Whether, in fact, the condition described by this term should be regarded as a disease is a question worthy of consideration. It is really a congenital anomaly, and may be viewed in affected individuals as a physiological condition. As a rule, in the simple form of ichthyosis, the palms and soles are not involved, though occasionally a keratosis of these regions is associated with general ichthyosis. Most of the so-called ichthyotic conditions of the palms and soles are now classed with the local keratoses.

(c) **Ichthyosis Hystrix.**—In this condition, also described as hystricism, there are usually some of the ordinary manifestations of simple ichthyosis. There are, however, cases in which the latter are apparently wanting, and this fact has led some writers to believe that the intense or hyperkeratotic grades belong in fact to a different category. The hystrix variety, though often widely disseminated, is never general, and in many cases there are regions of entirely normal skin upon the subjects of the severest manifestations of the disease. Further, the hystrix form is seldom symmetrical, as are both xerosis and ichthyosis simplex; the face is rarely affected, and the greater number of patients with typical lesions exhibit distinctly circumscribed regions of involvement. The palms and the soles may be the seat of dense circumscribed or diffused callosities, leathery masses or warty growths covered with horny caps, varying from the size of a small bean to large tumors. Reddish-brown, dark green, or even blackish growths, project from the level of the skin. Often the lesions are well marked by a limit in the median line of the body, at the occiput, coccyx, or the chin. At times they are elevated above the surface to the extent of several centimetres, when long, warty projections are covered with a shell-like or horny cap. When such caps are torn off a raw and bleeding surface is exposed, usually with hypertrophied papillæ. In rare cases there have been recognized, in connection with these extreme cases, singular defects of the ear; occasionally also growths upon the mucous surface of the mouth. The ichthyosis linguæ, of older writers, is now recognized as a wholly different disorder from that under consideration, being either a manifestation of lichen planus or of the so-called "smoker's patch" (*leucoplasie* of French authors). The hystrix variety of

ichthyosis may disappear spontaneously, or as the result of some intercurrent trouble. In a few rare cases there is a periodical exfoliation of the horny plates from the surface of the skin. Even in the milder forms of the disease there have been at times periods of marked amelioration, due to changes which were not well appreciated.

Pathology and Morbid Anatomy.—On section of the skin affected with ichthyosis there is recognized a hypertrophy of the epidermis and of the papillary layer of the corium, the cause of which is quite obscure. It has been believed that the essential cause was an unusually firm adhesion of the plates of the horny layer, in consequence of a hyperkeratinization of the cells immediately above the granular layer of the epidermis. Others believe that the failure of the glandular secretion is responsible for the result; and yet others have sought to show that the disorder is due to certain special chemical changes in the epidermis. In the hystrix variety, which Kaposi has chiefly investigated, the papillæ are found greatly elongated, above which the horny layers rise in the shape of dense cones. The arrangement of the latter suggests that seen in the bulb of the onion. The vessels of the corium are distinct, and there is also a cellular infiltration of the same region, with sclerosis of the connective tissue. The glands and the follicles are in some places normal, and in others are wanting. Crocker shows that the horny cells dip down deeper into the regions occupied in the normal skin by the rete pegs. He also shows that the adherent and stratified layer of each horny cap is composed at the apex of the papillary growth.

Etiology.—The disease is congenital and may be inherited, though often it is not, the inheritance when transmitted being either direct or indirect, several generations escaping. Occasionally all the children of an ichthyotic individual present symptoms of the disease; at other times those of one sex only; in still others some are free and some affected, of both sexes. Kaposi describes a woman, the subject of ichthyosis, whose five sons were affected, while three daughters escaped. Crocker describes a family of seven girls and three boys, the boys being the youngest, in which the disease affected four of the girls alternately, beginning at the oldest, and also the oldest boy, the boy exhibiting the same condition. The profession or occupation of the subject, and the failure of proper attention to the child in the early periods of its life, seem to have no bearing whatever upon the production of the disease. A neurotic origin in some cases of ichthyosis can scarcely be questioned.

Diagnosis.—There are few dermatoses which are so readily recognized as ichthyosis, the disease appearing soon after birth, the skin being either uniformly and symmetrically rough, dry, and scaly, or mapped out in polygonal plates, light-colored or dirty-shaded, furrowed or warty.

The rough resemblance to the skin of the fish, from which the disease takes its popular name, is so striking as to establish its identity. It need never be confounded with the disease known in this country as *angioma pigmentosum et atrophicum* which it only faintly resembles, the last-named affection being always the most conspicuous on the exposed surface of the body, such as the hands and the face, while all forms of ichthyosis are decidedly most obvious upon regions habitually protected by the clothing. In *prurigo* there is always a great degree of thickening of the skin, with roughness, dryness, and harshness; but this can readily be recognized as a condition secondary to the excessive irritation produced by incessant scratching.

Prognosis.—If ichthyosis be rather a deformity than a disease, there can be no question of relief by remedial measures. The prognosis for the majority is decidedly unfavorable, since the ichthyotic patient, after periods of aggravation and amelioration of symptoms in summer and winter, in good and ill health, eventually dies ichthyotic. Cures are, however, reported in some of the milder cases. The *hystrix* variety often requires surgical interference for the removal of disfiguring or uncomfortable tumors, and with reference to the question of prognosis is set in a category apart from the other forms of the disease.

Treatment.—The treatment of the several forms of ichthyosis is purely local. Internal medication is wholly valueless, and should never be recommended. No treatment of a local character is comparable with the removal of the patient from an inhospitable to a suitable climate; that is to be preferred in which there are but few temperature changes of a severe grade, and that whose air is modified by proximity to the sea.

Baths are indicated in most cases, and usually with as little soap as can be employed, though in severe cases soft-soap inunctions are recommended by some authors. I prefer in our Northern climate the bran bath the bran being placed in a muslin bag, which is immersed in warm water, the patient bathing daily. Alkaline baths, in which the water is medicated with the bicarbonate of sodium or potassium, are also useful. After the bath the skin should be anointed with any one of the fatty substances which is capable of keeping the skin in a soft and pliable state; for example, lanolin, the oil of sweet almonds, cod-liver oil agreeably scented, neat's-foot oil (decidedly less valuable than the others), olive oil, lard, suet, glycerin and water, agneline, and the petroleum products known as *cosmoline*, *vaseline*, etc. Kaposi recommends a five-per-cent. naphthol ointment; ointments also containing three to twenty per cent. of resorcin, sulphur, salicylic acid, and the oxide of zinc, are available. These salves should be benzoinated. The complications of ichthyosis (eczematous, psoriasiform, and other) require treatment especially adapted to these conditions. The tumors and warty growths of the *hystrix*

variety may be curetted or excised in the operations of surgery. Crocker recommends removing the horny caps and painting the surface with a saturated solution of salicylic acid and alcohol. Ointments of tar, lead, chrysarobin, and pyrogallol are also serviceable.

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SCLERÆMA NEONATORUM. (JAMES NEVINS HYDE.)

Deriv., Gr., *σκληρός*, hard; Lat., *neonatus*, newborn.

Synonyms: Scleræma of the Newborn; Scleroderma Neonatorum; Induration of the Cellular Tissue of the Newborn; Fr., *Algidité Progressive* (Hervieux); *L'endurcissement Athrepsique* (Parrot); Ger., *Zellgewebsverhartung der Neugeboren*; *Sclerem der Neugeboren*.

Definition.—Scleræma neonatorum is an affection of both newborn and recently born infants, in which the skin and subcutaneous tissue are the seat of a characteristic induration.

Symptomatology.—This disorder is essentially different from scleroderma, both with respect to the age of the subjects affected and with respect also to objective symptoms. It is to be distinguished not only from scleroderma, but also from both scleræma and œdema neonatorum. The distinction was first well established by Parrot, who in his contribution to the subject of athrepsia clearly recognized the essential differences between these affections.

The symptoms may be present at birth, or develop soon after; rarely, however, later than a month or six weeks after the birth of the individual. They are usually first displayed in the lower segment of the body, spreading thence over the superior portions, and commonly first noticed in the lower extremities, extending over the back, and with more or less rapidity involving the entire surface of the body, including the face. In some cases, after reaching a certain degree of evolution, there is spontaneous cessation of the line of advance.

The skin is transformed into a dirty yellowish or yellowish and white leathery substance, later somewhat deeper in color, which is so infiltrated that it can be no longer gathered up between the thumb and finger or depressed by pressure with the thumb. The skin has a marbled appearance and feeling, being smooth, polished, tense, and exceedingly firm. There is usually a subnormal temperature, the infant frequently lying without motion of the facial or other muscles, expressionless and rigid. In some cases the body can be lifted from a bed without change of position. The inflexibility of the lips usually prevents suction of the nipple of the mother, and the stiffness of the jaw interferes with the motions also of the mouth. The pulse is much below the normal, in some cases being not more than fifty to sixty in a minute; the respirations are feeble and few; the cry of the child may be absent or reduced to a feeble wail; and in the course of a few days, without other morbid symptoms, the child may perish. In some instances children are dead-born, exhibiting all the symptoms of the disorder. The complications of this affection when life is prolonged are due to the continual lowering

of the bodily temperature, the skin eventually losing its yellowish-white shade and becoming livid, purplish, and in some cases black, from the occurrence of gangrene. At times the temperature rises to a normal point; the œdematous induration disappears, the pulse and respiration are quickened, and recovery ensues.

Pathology and Morbid Anatomy.—Kaposi, Förster, Virchow, and Sanger have examined sections of the skin, and arrive at different conclusions. There is an œdematous infiltration of the derma, which seems to be composed largely of stearine; otherwise no marked changes are recognized. There is no cellular infiltration, and the connective tissue is not manifestly hypertrophied. The plugging of the lymph-channels and the inflammation of the lymphatic vessels which have been occasionally recognized are believed to be secondary changes. Sanger states that the fat of the newborn child melts at 130° Fahr., and is solid at 89·6° F., while that of adults melts at 107° F., and becomes solid below 32° F. He ascribes the difference to the excess of fatty acids, and believes that the causes which produce the depression of temperature are the essential factors in the production of the disease. Parrot declares that there is attenuation of the entire thickness of the cutaneous tissue with faintness of definition of the rete cells. With this he recognizes that the fat islets are diminished in size, and sometimes the fat vesicles emptied of their contents.

Etiology.—The immediate cause of the symptoms is the retardation of the capillary circulation in the skin. The remote causes include all the circumstances which tend to retard the cardiac circulation; as, for example, disorders of the heart and lungs, such gastro-intestinal affections as are common in infancy, the lack of proper care, exposure to cold soon after birth; and, lastly, inherited syphilis.

ŒDEMA NEONATORUM. (JAMES NEVINS HYDE.)

The œdema of the newborn has been confounded, as indicated above, with scleræma neonatorum, though the two are to be distinguished. The former is an anasarca of the skin associated with retardation of the pulse due to any causes—internal or external—interfering with the circulation. The disorder is very rare in England and America, but somewhat more common in France and Germany. The first symptoms of the disease are apparent within a few days after the birth of the child, which, however, may also be prematurely born, exhibiting such symptoms. As in the disorder just described, the lesions are first seen upon the lower extremities, especially the legs, which are tumid, cold, and of a livid hue. The tissues may be indented with the finger, the depression thus produced persisting as in ordinary œdema, for a longer

or shorter period of time. In severe cases the œdema extends upward, involving the thighs, the hands, and the lower segment of the trunk, including the genital regions, the back, and in extreme instances the upper portion of the chest. It is particularly noticeable, when well marked, over the posterior faces of the thighs and the calves of the legs. The skin, much more often than in the disorder previously described, is tinted in various shades of red, purple, and violet, or it may be deeply yellow. When well marked, the induration may increase to a point where it is difficult to depress the surface of the skin. In rare cases the entire surface of the body is affected, respiration is impeded, the circulation becomes slow, the temperature subnormal, the cry exceedingly feeble, and all other symptoms of profound depression are recognized. The child is drowsy, and can not be aroused to take the nipple. In extreme cases death may occur within a few days. In other instances, where the progress of the disease is less severe, the symptoms improve; the skin gradually becomes softer; the œdema disappears after becoming more readily depressible by the finger; and finally the health of the child is entirely restored. Variations occur in which the symptoms in the skin are first apparent upon the trunk, the hands, or more rarely upon the face; and in some instances there is an involvement in a capricious way first of one and then at random of another of the regions of preferred involvement. A febrile reaction has been noted in some instances.

Pathology and Morbid Anatomy.—This is obscure. In one case a thrombus in the femoral vein was discovered; in another, a disease of the kidneys. When the tissue is divided with the knife there is usually a fluid exudate, chiefly serum, which escapes, and the fat of the child is noticeable for its density and deep color. The liver is usually enlarged, and the spleen congested.

Diagnosis.—The diagnosis is chiefly from scleræma neonatorum. The distinction is made by noticing that, in the disorder here considered, there is a very marked tendency of the œdema to appear chiefly over the posterior portions of the body in a reclining position. In scleræma, on the contrary, the effused product is less subject to the action of gravity, and the skin is denser, firmer, whiter, less impressible by the finger, and at times attached to the subjacent tissue. A livid and purplish hue in œdema is much less common. In the other diseases named the skin is more easily impressed; and the stiffness of the joints, the jaws, and especially of the body when it is raised in the hands, are either wholly wanting or much less conspicuous. Both disorders are easily differentiated from scleroderma of adults and children. The youngest age when scleroderma has been noticed, is soon after the first year of life.

Prognosis.—The prognosis of both disorders is exceedingly grave if the general surface be involved. Recovery, however, under favorable

circumstances, can be expected when the two diseases are but partially developed. The prognosis of scleræma is much more serious than that of œdema.

Treatment.—The indications for treatment are: to increase the activity of the cardiac contractions; to promote absorption of the fluids effused in the skin and subcutaneous tissue; and to raise the bodily temperature of the child. These can be usually simultaneously met by the use of the incubator, by surrounding the child with hot-water bottles, by wrapping it in warm wool, and, when the nipple can not be seized, by using as nutritious a food as the child can be made to swallow. Frictions of the surface with warm flannel and the palms of the hands are to be recommended; and, when possible, nutritious oily substances should also be employed at the time of friction, such as cod-liver oil, the oil of sweet almonds, or fresh lard. The French advocate camphorated alcohol and other stimulating lotions warmed before application. The stomach pump may be employed for the purpose of introducing peptonized milk and alcoholic stimulants. Subcutaneous injections of milk may also be given. The direction of frictions should be from below upward.

SCLERODERMA. (JAMES NEVINS HYDE.)

Deriv., *σκληρός*, dense; *δέρμα*, the skin.

Synonyms: "Hide-bound Disease"; Sclerodermia; Scleræma Adultorum; Chorionitis; Sclerostenosis; Scleriasis; Sclerostenosis Cutanea; Cutis Tenea Chronica; Elephantiasis Sclerosa; Sclerosis Telæ Cellulosæ et Adiposæ; Addison's Keloid; Fr., *Sclérème des Adultes*; Sclérodermie. Ger., Hautsclerom.

Statistical frequency in America, 0·030.

Definition.—Scleroderma is an affection of the skin and subcutaneous tissue, resulting in a diffuse or circumscribed induration of the parts involved.

The disorder was first described by Curcio, in 1752, since which date, though of relatively rare occurrence, it has given rise to a voluminous literature. The most conspicuous contributors to the latter have been Alibert, Thirial, Hebra, Kaposi, and the later authors of treatises on cutaneous medicine.

Two clinical varieties of the disease can be distinguished, though intermediate and mixed forms occur: (*a*) Diffuse symmetrical scleroderma; (*b*) Circumscribed scleroderma, to which the term *morphœa* was at one time exclusively given.

DIFFUSE SYMMETRICAL SCLERODERMA.

Symptomatology.—This disorder is characterized by a change in the skin, whose prominent symptom is at first one of infiltration of the

tissue, and, consecutive to the latter, a resorption of the infiltrated tissue, and a resulting atrophy. The disease is rare, and yet has been the subject of an extensive literature.

In the beginning of the disorder in typical form the skin becomes œdematous, and later both firm and unimpressible. This condition may succeed exposure to cold and damp, with rheumatoid pains in the extremities and the joints. It is noticeable that without inflammatory symptoms the change in the skin ensues, which, after the swelling has existed for a relatively brief period of time, becomes symmetrically firm and rigid over a part or the whole of the bodily surface, extending from the former to the latter. Sometimes the onset of the disease is so gradual as to excite but little attention. It affects especially the upper segment of the body, much more rarely the lower extremities. In the former situation it is most common over the surface of the chest, in front and behind, over the shoulders, upper arms and forearms, the back of the neck, the scalp, the face, the small joints of the hands, and, after these, any or all regions of the bodily surface. When the sclerodermatous induration is fully attained the skin of the affected region is found to be of leather-like thickness and tenseness. At times the volume of the skin is increased. The line of demarcation is ill-defined; and, though thus poorly circumscribed in exactness, is often appreciable within the limits of an inch or more, beyond which boundary line the soundness and suppleness of normal skin can be readily recognized. The surface can not be impressed with the finger when thus transformed; but when the latter is briskly drawn across the surface, it can be seen that a white line is left after it, such as can be observed in the skin of the patient affected with scarlet fever, a faint rosy outline bordering the whitish or yellowish-white streak.

When the face is symmetrically involved the expressionless character of the visage is in a high degree striking, in consequence of the immobility of the mouth and the failure of motion of the facial muscles, which may also be implicated, to produce expression changes. The lids may or may not be similarly affected, and that either by contracture of the orbicular muscle or by eversion. When the skin covering the chest is involved it may seriously impede the respiratory movements—a feature which, in my personal experience, was chiefly marked in the first case of scleroderma I ever saw, and which has been much less distinct in the chest cases since under observation. In women, the flattening of the breast to the tissue beneath is very marked, and suggestive of the condition often seen in the disease known as *cancer en cuirasse*. When the mucous surfaces are affected, that of the mouth (tongue, palate, and neighboring parts) and vagina exhibit the symptoms of the disorder in a modified degree.

The surface of the skin thus involved presents different aspects in

different cases, and in the same case at different times. The color may be suggestive of marble in its whiteness, streaked, mottled, and deeply pigmented from fawn to black shades, smooth or raised in deep or superficial tubercles, with increasing or diminishing sensitiveness to external irritants, occasioning pruritus. The skin may, however, be devoid of subjective sensation; may secrete sweat and sebaceous material, or be almost entirely dry; be smooth or scaling, or curiously overspread with patches of a yellowish or brownish shade suggesting moles or *striae atrophicæ*, or be generally cool to the touch. In some instances minute blood-vessels form upon the surface, and the vascularization of the skin, commingled with points of pigmentation, presents a contrast with the waxy whiteness due to other causes. In general, the natural lines of the skin are effaced by the swelling. By the calorimeter the temperature may be recognized as increased, diminished, or normal. Pressure upon the part may be productive of pain. Tactile sensibility is usually unimpaired; in other respects, the skin affected with scleroderma exhibits no marked change, and is subject to the accidents of other surfaces, such as mechanical and chemical irritation, the invasion of the pus cocci, and the other causes capable of producing dermatoses.

The course of the disease after complete evolution is attained, may be either in the direction of a satisfactory involution, the skin resuming its natural suppleness and functions, or retraction may occur as the result of atrophy. In the latter event the result is usually less grave than might be anticipated, the wasting being as symmetrical as was the previous involvement. The shrunken skin pressing upon the tissues beneath results in the removal of the fat cushion, and often the stretching of this thinned integument over the periosteum and bones. The lips may be reduced in size; the teeth fall, from contraction of the mucous membranes; the globes of the eyes may be exposed in consequence of eversion of the lids, and, in well-marked cases, wasting of bone may occur beneath the atrophied skin, the lower jaw being perceptibly diminished in volume as the result of pressure. An entire limb or a portion of it may thus shrink and shrivel; pseudo-anchylosis may prevent flexion and extension of the hand at the wrist, or the fingers upon the metacarpal bones, such as the *sclérodactylie* of Ball (Soc. de Biologie, 1880) and the *cietrizing scleræma* of Wernilie. In these conditions each one or several of the fingers are forcibly flexed toward the hand, and others extended—for example, when the first and second are flexed at the first phalanx, the third and fourth at the second, and the thumbs strongly everted, the fingers being firm and stiffened in consequence of the contraction of the skin. This atrophic state once fully induced, a return to the normal condition never occurs.

The disease may continue for years, changing its situation, and ob-

serving periods of aggravation and improvement, though the latter is somewhat rare. As a rule, the tendency of the malady is toward a slow retraction of tissue, involving finally a large portion of the skin, and when from one half to two thirds of the superficies of the body has been invaded, there are usually visceral complications which induce a fatal termination, such as disorders of the bronchial tubes, lungs, heart, blood-vessels, and kidneys. The diseases which develop in these organs in the direction of chronic inflammation, tuberculosis, anæmia, or acute rheumatism may at any time precede or follow the manifestations of scleroderma.

Pathology and Morbid Anatomy.—Section of the skin in typical scleroderma reveals a cell-growth about the vessels in the corium which tends to narrow the lumen of each. In some cases there is a coincident thickening of the vascular sheaths. The same cell infiltration is recognized about the glands of the skin, and also about the capsules containing the fat. It is believed that the vascular changes are first in order of occurrence, as the result of hypertrophy of connective and elastic tissue. The glands of the skin are compressed from the operation of the causes described above, and the lymph-vessels as well as the vascular channels are also obstructed by external pressure and an increase in thickness of the vascular wall. Back of all these changes unquestionably lies a disorder of the nervous centers, as yet but little appreciated and exceedingly difficult to determine. The trophic nerves which have been regarded as the important factors in the production of the disease have been recognized as the seat of alteration. In a very few instances sclerosis of the anterior horns and of the cerebral convolutions has been demonstrated, having in cases a fatal termination. The thickening of nerve sheaths, and fatty degeneration of nerves found in relation with patches of scleroderma, are rightly regarded as the probable results rather than as the causes of the cutaneous disorder.

Etiology.—Women are represented in three fourths of all patients affected with the disease; the latter are most often in early life. After this period the disorder occurs most frequently among the middle-aged. Crocker puts the variation of age between which the disease occurs as from thirteen months to seventy-two years. Other causes described are numerous, and possibly have but a very indirect bearing upon the production of the malady. These may be cited as disorders of the kidneys, lungs, and other viscera, acute rheumatism, tuberculosis, chloro-anæmia, erysipelas, unusual fatigue, exposure, traumatism, and extreme temperature changes. Patients exhibit classical phenomena in this disease for which no cause whatever can be recognized.

Diagnosis.—The leathery hardness and waxy whiteness of the skin affected with scleroderma is, as a rule, so characteristic of the disease that

it can scarcely be mistaken for any other. The symmetry of its involvement, the general coolness of the surface, and the age of the patient are significant. Carcinoma of the skin of the chest in women (*cancer en cuirasse*) strongly resembles scleroderma of the same region; but in the former there is usually nonsymmetry and tolerably distinct definition of the patch; lymphatic obstruction of one arm and that of the side of greatest involvement of the chest; and (of higher significance) the development of firm, cancerous nodules, which in advanced cases break down more or less rapidly into cancerous ulcers, often in and about the region of the nipple. The advancing line of the disease in the cancerous variety is not a faintly defined and symmetrical border, but a condition in which tongue-like prolongations of infiltration of a dull-reddish or purplish hue significantly outline the progress of the cancer. Scleroderma, furthermore, is much more indolent in its progress and much less often accompanied by pain.

Scleroderma neonatorum occurs at a much earlier period of life, within a few months after the birth of the child, and never as late as the date fixed for the first appearance of the disease in the youngest recorded case of scleroderma.

In angioma pigmentosum et atrophicum the exposed portions of the body are chiefly if not exclusively involved, and the growth of tumors of epitheliomatous type is characteristic.

Prognosis.—The future of patients affected with scleroderma is not so grave as was once supposed. Many with a partial involvement of the skin in the course of months or years, sometimes in a much shorter time, go on to a satisfactory recovery; in yet other cases, even though the induration of the skin persist for long periods, sometimes better and sometimes worse, there is eventually an improvement. According to Crocker, cases which are early indurated are more favorable than those which are at first œdematous, as less likely to result in remediless atrophy. When the latter occurs the result is hopeless, so far as regards at least the part thus affected. As has been already shown, in some of the atrophic forms, the result is fatal in consequence of a morbid epiphenomenon.

Treatment.—The hygienic management of these cases is of chief importance. The patient should always be removed from an inhospitable to a salubrious climate, that particularly where the temperature is equalized by proximity to the sea. The skin should be thoroughly protected by woolen garments worn outside of soft lisle-thread or other thin undyed material of cotton, and should be carefully protected from the causes which induce the rheumatic and other complications so often noted.

The nutrition of the invalid demands a simple and generous diet, and the use of cod-liver oil when that article is tolerated by the stomach. Ferruginous and other tonic medicaments are often indicated, including

the syrup of the hypophosphites, matzoön, matzoöl, malt, and maltine. Internally a number of agents have been administered for the relief of the disorder, including purgatives, sudorifics, diuretics, arsenic, nux vomica, strychnine, jaborandi, mercury, the iodide of potassium, and other drugs. None of these, however, can be demonstrated to be of special value in any one case, and all are to be avoided in the management of the disease.

The local treatment is a matter of importance. Most authors recommend shampooing with saponified, alcoholic, and other stimulating lotions, after or before a Turkish bath, and the use also of inunctions with some fatty substance, such as the oil of sweet almonds, lard, lanoline, and suet; massage combined with the inunction of cod-liver oil; medicated vapor baths (sulphurous, etc.) have also been advised. The galvanic current over the region of the spine has been followed by good results in improving the circulation of the affected parts.

In all cases where practicable, especially in mild weather and when the patient can be removed to a suitable climate, I have found decided advantage from warm salt baths, followed later by the use of cool water containing salt. These baths are administered in two ways: in one, the salt is moistened with water of a desired temperature until it is only partially dissolved, and then rubbed briskly over the entire surface of the body, avoiding the sensitive portions of the face, then washed off afterward with water which is sufficiently warm, the temperature being slowly lowered until cold affusion of the entire surface is practiced. In other cases, salt is dissolved in the water in the strength of one quarter of a pound to the gallon, and the patient uses this solution either as a douche, by sponging, or by immersion. After such bathing the surface is rubbed dry, and the clothing replaced previous to gentle exercise in the open air.

CIRCUMSCRIBED SCLERODERMA (MORPHŒA).

Gr., *μορφή*, form.

Within a relatively recent date the term *morphœa* was employed to designate a disorder with which the symptoms described under the name scleroderma were not then included. As distinguished from scleroderma, its statistical frequency in America is registered as 0·031.

Symptomatology.—Morphœa is still regarded by some authors as a disease wholly different from scleroderma. It is, however, to-day well recognized as a circumscribed variety of the disease just considered.

It is decidedly more common in this than in the other form, and in its different expressions presents the widest variety and the most singular differences. It occurs in points, patches, bands, streaks, ribbons, and other odd areas of involvement, which often require some skill for their recognition.

The patches may be single or multiple, varying in size from a split pea to the palm of the hand, and even larger. They may occur insidiously without attracting attention, or be noticeable on first development. They are irregularly shaped, usually well defined, and in color vary from the dead whiteness of an old scar to a yellowish and even a darker shade of color. In typical patches the border is marked by a peculiar shade of pinkish, lilac, or violet, which when closely inspected is seen to be due to a congeries of very delicate, slightly dilated blood-vessels. This lilac-tinted border may be narrow or of considerable width, and its vessels in some instances extend irregularly in branches over the area of the main patch. The latter may be nearly at the level of the adjacent skin, or be decidedly raised above it, so as to suggest, when handled, the feeling of a cushion, sometimes almost with a globoid outline when viewed from the side. The patches are usually limited to one side of the body, and may be arranged in the line of distribution of one or several nerves, as in the case of shingles. They occur upon the neck, the face, the trunk, the breasts, and the extremities, the lower being rather more often affected than the upper; in both cases the patches are most apt to be distributed along the axis of the limb in the direction of the nerves. As a rule, the infiltration of the part renders it difficult to pick up the tissue between the finger and thumb. The whitish portion of the patch may be smooth, dry, fissured, destitute of or provided with hair, or (what is common in the ovoid and circular patches) marked here and there by minute depressions suggesting the orifices of the ducts of the secreting glands. The course of the disease after the patch is fully developed is either toward contraction, such as occurs in the symmetrical form, or in the direction of complete recovery, the skin resuming its usual suppleness and pliability. Irregular forms often occur in the neighborhood of the circumscribed patches, especially along the neck (minute puncta, pea to finger-nail sized, and oddly contoured and shaped markings). Other variations resemble bands, ribbons, and streaks, single or multiple lesions seen especially upon the brow in curves or ridges lying in immediate proximity to the involved part. The combination of a groove parallel to an elevated ridge running along the forehead or nose is not rare. I have seen two very interesting varieties of morphea, in which a patch was situated exactly in the median line of the body with symmetrical distribution on either hand—one immediately over the vertical line of the nucha, the other directly over the sacrum—the latter, one of the largest patches of circumscribed scleroderma I have ever seen.

The subjective sensations in these cases may be insignificant, or in the direction of pruritus, pain, burning, or tingling sensations.

In some instances the areola of dilated capillaries is absent; in others, the color of the center of the patch, instead of being whitish or scar-

PLATE XIII.



CIRCUMSCRIBED SCLERODERMA (Hyde).

like, is deeply pigmented, vascularized, or colored in shades of brown, green, and even black. Cases are described in which the development of blood-vessels and pigment at one or several points in the neighborhood of typical patches have occurred when the skin beneath was not involved so as to present characteristic symptoms of the disease. Other rare complications reported are the induction of keloid, ulceration, exostosis of bone, and adhesion of the skin after atrophic changes to the subcutaneous tissue.

The course of the disease is usually indolent; at other times, if the part be carefully watched, changes may be noted from day to day. The involution of the disease may be as rapid as its onset; in other cases the two are equally indolent and prolonged. *Morphœa* rarely involves a large surface of the body, for even when the patches or bands are multiple they are usually limited to one region, or if two are involved it is rare that the two are affected to the same extent. In a case exhibiting multiple lesions under my observation there were several well-developed egg-sized patches on the neck, and one or two finger-nail-sized patches on the side of the chest. In rare cases the disease—as in the symmetrical forms of scleroderma—proceeds with greater or less rapidity to a fatal termination in consequence of the production of tuberculosis, anæmia, or some disorder in the viscera. This is one of the rarest of issues.

Pathology and Morbid Anatomy.—The microscopical appearance of sections of skin affected with *morphœa* betrays but few evidences of the nature of the morbid process. There is an exudation occurring chiefly within and about the blood-vessels leading to the affected portion of the skin, producing a diminution in the caliber of the vessel and in a proportionate degree obstructing the vascular current. There is in the part supplied by vessels thus affected a diminution in the supply of blood, while at the periphery or border of the affected patch there is a dilatation of the smaller capillaries, producing to the eye the lilac-tinted or violet-hued zone. In some cases, as has been already noted, this obstruction is but partial, and the affected area is not wholly cut off from the blood supply. Vessels still pervious to the sanguineous current traverse the atrophied skin. According to Crocker, the reticulum, consisting of fine fibers with well-defined borders, between which the cells of the part are found, extends irregularly over the areas of involvement. The groups of cells are decidedly more abundant about the glands and follicles, less often about the sweat-glands than about the sebaceous glands. In the latter an increase of the connective and elastic tissue flattens the papillæ, compresses the blood-vessels, and induces an atrophy of all the organs surrounded. It will be seen, from what precedes, that the essential nature of the process can not be determined from the morbid anatomy of a patch affected with *morphœa*.

Etiology.—The disease is more common in men than in women, and occurs at all periods of life, more often, however, in young adults and children. It is rare before the second year, and still more rare when first displayed after middle life.

It is decidedly more commonly observed among those who are subject to the influences capable of producing disorders of the nervous system, particularly domestic and financial anxiety, grief, and exertion which induces exhaustion of the nervous energy. In some cases malaria is effective. The influence of climate is of prime importance, many cases occurring in regions where variations of temperature occur from heat to cold, and where there is exposure of the body to mountain winds chilled by passing over regions of snow and ice. Local and external causes capable of producing patches of morphœa are friction, traumatism, and local inflammations due to excess of heat, and to medicaments—for example, blistering, the friction of trusses, corsets, garters, and the seams of clothing.

Diagnosis.—Morphœa is distinguished from keloid, which it most closely resembles, by the fact that in the latter disease the tumors are denser, as a rule, and much more elevated. When well vascularized the blood-vessels scarcely ever produce a tinted zone about the lesion, but boldly traverse the surface in coarse red lines, which often rise from the level of the skin to some distance upward toward the summit of the tumor. Further, the clawlike prolongations usually seen at the terminal extremity of the long axis of the keloid growth are characteristic. In vitiligo there is no structural change in the skin, but only an absence of pigment well defined in the flat patches, which are neither elevated above nor depressed below the general level. Crocker calls attention to the fact that some of the cases described as hemiatrophia facialis are not examples of morphœa occurring in the regions supplied by the fifth nerve, but are independent disorders affecting all the tissue, and due to either defective innervation of the part or to arrested development. In general, however, most of the cases described by this name are due to absorption of the material deposited in patches of morphœa. The symmetrical forms of the disease are readily distinguished by the greater diffusion of symptoms over the surface of the body, for in a few instances morphœa can be recognized as a distinctly symmetrical disease, the lesions being situated centrally upon either the anterior or posterior aspects of the body, without, however, exhibiting diffusion over the surface.

Prognosis.—The prognosis in morphœa is much more favorable than has been in the past generally considered. After, indeed, somewhat rapid extension, the patches of the disease usually disappear with no grave result, even in cases of persistent atrophy. Complete involution of the disks may require a long period of time—from two to fifteen

years or more ; but even in these prolonged cases the improvement, as a rule, is substantial and satisfactory.

Treatment.—The constitutional treatment of the patient affected with this disease is practically that of scleroderma, already considered. The best of hygienic measures are to be recommended, including a nutritious diet, a suitable climate, and the use of such medicinal articles as cod-liver oil, iron, and the tonics in general. The local treatment of the affection has not proved wholly satisfactory. Shampooing the affected surface with the tincture of green soap and hot water, anointing with oily and fatty substances, and topical medication in the way of mercury, salicylic acid, and chrysarobin, prove of little value. Favorable results have been reported after galvanization of the part ; electrolysis, with the introduction of needles into the border of the patch, has also been reported effective. Considering the favorable issue in the majority of untreated cases, and the ill consequences of overtreatment in others—namely, the production of irritation—one should look with caution upon all local management of the disease. Brocq advises, when practicable, the application of the plaster of Vigo, with mercury, constantly applied, for such time as the application is tolerated. With this, he advises over the spinal column, once a week, the application of the actual cautery, at the point where the nerves issue to the disordered portion of the skin.

Mixed cases of scleroderma in diffused and symmetrical forms, and of morphœa, are recorded ; in some instances the former preceding the latter, and in others the order being reversed. In the light of this experience it is difficult to understand how Kaposi and others refuse to accept the view of many modern dermatologists that these diseases are examples of one morbid process.

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ELEPHANTIASIS. (JAMES NEVINS HYDE.)

Deriv., Gr., *ἐλέφας*, an elephant.

Synonyms: Elephantiasis Arabum; Elephant Leg; Barbadoes Leg; Bucnemia Tropica; Cochin-China Leg; Morbus Elephas; Pachydermia; Elephantiasis Indica; Ger., Elephantenaussatz; Knollbein; Ital., Elefantiasi.

Statistical frequency in America, 0.46.

Definition.—Elephantiasis is a chronic endemic or sporadic and circumscribed hypertrophy, involving both the skin and subcutaneous tissue with inflammatory obstruction of the blood and lymph channels, resulting in gigantic enlargement of the part affected.

The term elephantiasis has long been employed for the designation of any enormously sized hypertrophy of portions of the body, such as may occur in fibroma, lepra, syphilis, dermatolysis, or angioma. With a more exact knowledge of the pathology of these several affections the term is now generally used to designate, if not one, at least a group of disorders with distinct characteristics.

Symptomatology.—The disease occurs in India and some other countries as an endemic disorder; sporadic cases are also found in regions where endemic forms are never seen. Such has been the history of the disease in this country, in many portions of which typical forms have been recognized and fully described. In the regions where elephantiasis occurs in endemic type there is usually recognized a prodromic stage, characterized by febrile temperatures, alternating with stages of sweating, extreme distress, and severe lumbar or articular pains, with or without such febrile stage. The part most often involved (usually a lower extremity, rarely two at the same time, more particularly the leg and foot, and rather more rarely the thigh and the buttock) is affected with a vivid redness and swelling, and becomes painful from the tension of the part, due to infiltration of the subcutaneous tissue. In many cases the disorder suggests an erysipelas, and such, in fact, it often is, the streptococcus erysipielatis being responsible for the mischief. In yet other cases it is obvious that the lymphatic system is chiefly involved, the lymph-vessels becoming tumid and tense, and, when punctured, giving exit to a chylous or milky discharge. In some cases other regions than the extremities are involved, chiefly the genital organs in the two sexes—the penis and the scrotum in

men, the labia majora and minora and the clitoris of women. In the same manner the upper limbs, as well as the regions of the face, including the brows, the cheeks, the ears, and other regions of the body, may be involved. Other symptoms than those described occur as a result of the anatomical situation and configuration of the involved portions of the body; for example, intense inguinal pains and reflex neuralgia of the spermatic cords, pains in the sciatic and gluteal regions in disorders of the scrotum, in which cases also there may be the production of a hydrocele. Variations occur from the types suggested, in which the part, instead of being red and tumid, is white and shining, the skin remaining apparently unchanged or being somewhat œdematous. In other cases it is thickened and adherent to the tissue beneath, and destitute of its normal elasticity and pliability.

One of the striking features of this disease is its evolution by accesses. After a febrile exacerbation with an increase in the tumefaction, with or without an erysipelatous or lymphatic involvement, or inflammation of the veins, there usually follows amelioration of all the symptoms. Sooner or later, however, in all typical cases, there is a recurrence, sometimes in exaggerated type, of all the preceding morbid phenomena. With or without fever, there is renewed inflammatory involvement of one or several of the tissues described above, and with each access of the disorder the part affected usually becomes swollen, roughened upon the surface, and the seat of secondary lesions of the sort described below. It is in this way that the characteristic deformity is produced which has given the name to the disease, "elephant leg." In typical cases, when the limb for some time is thus involved, it is several times its normal dimensions, loses its natural outlines, and exhibits to the eye the appearance of an unwieldy and massive cylinder, at the extremity of which is a foot swollen wholly out of shape and resembling that of an elephant. Viewed somewhat more closely, it will be seen, in well-marked cases of involvement of the leg, that some of the natural folds of the skin are increased so as to produce linear depressions, even at times resembling crevasses in the tissue, in which accumulate secretions from the skin undergoing degenerative metamorphosis. The integument is soon transformed to an unwholesome tissue, tense, smooth, bluish, and shining, of dirty-brown or blackish hue, covered here and there with warty growths and vegetations, or the seat of changes best recognized in the severe and advanced forms of eczema verrucosum, ulcerations occurring here and there over the regions involved. These at times open the vascular channels so that either lymph or blood escapes freely. An occasional healing of these wounds in regions where there has been a loss of this kind results in an irregular scarring, extending over the surface of the limb, the scars being commingled with unhealed ulcers and crusts covering superficial losses of

continuity. In yet other cases keloidlike growths develop over the surface, the glands in the neighborhood of the region involved become implicated; the bones enlarge in all dimensions; and the unwieldiness of the part is one of the most annoying of the results. As a rule, the subjective sensations, when inflammatory complications are not present, are slight, though during the course of the inflammatory process the pain and the resulting sense of tension are very great. In some cases the actual loss of lymph from a lymphorrhagia becomes exhausting. When other parts of the body than the extremities are involved, the bulk of the organ may be increased to the extent noticed in the elephant leg. The scrotum is sometimes so voluminous that it weighs many pounds, the penis becoming indistinguishable in the general mass. Similar enormous enlargement of the genital parts of women occur, the dependent growth of many pounds' weight swinging between the lower extremities. In other cases the lips, the ears, the cheeks, the nose, the skin covering the shoulder blades, the arm, the forearm, and the hand may be tumefied and deformed by hypertrophied masses, which, however, rarely present the grave changes seen in elephantiasis of the lower extremities and genital regions. The elephantiasis telangiectodes, of Virchow, is a disorder of vascular tissue and of congenital origin. Other tumors of elephantiasic character have been described under this title, including certain forms of *nævus lipomatodes*, of *molluscum fibrosum* (fibroma), and of *papillomata*.

Pathology and Morbid Anatomy.—When the affected parts are incised they are found to be throughout indurated, the density of the mass being uniformly present in all the superficial and deeper tissues. The color in general is grayish and yellowish; the appearance that of tissue which has undergone lardaceous, fatty, or gelatiniform transformation. Lymph can be in places expressed on pressure. Hypertrophied fibrous tissue constitutes the bulk of the mass, above which often stretches an epidermis scarcely thickened in abnormal measure. In some portions of the densely hypertrophied subcutaneous mass, the reticulum of fibrous tissue is lustrous and sclerotic; in others it is soft and apparently in a state of semiliquefaction. Lymph spaces, at times distended considerably with a clear or turbid lymph, occur here and there in the mass of all typically involved structures. The blood and lymph vessels, nerves and nervous sheaths, and even the underlying osseous structures, participate in the general sclerotic hypertrophy and cell infiltration. The muscles and cutaneous glands may or may not take part in the morbid process. The verrucous vegetations, telangiectases, and erysipelatous complications of the disease in individual cases are characterized by the changes usually recognized in these conditions (rete hypertrophy, vascular dilatations and new formations, ampulliform sacs filled with blood, lymph, etc.).

The morbid anatomy points with clearness to obstructive disturbances

PLATE XIV.



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ELEPHANTIASIS (Chatelain).

in the vascular channels with resulting œdema, and lymphatic or serous effusion. The remote results and occasional accidents of this obstruction are readily explained when the frequent repetition of the effective cause is considered. In the endemic cases this obstruction is produced by the blocking of the lymphatic channels by the *filaria sanguinis hominis*. It is supposed that mosquitoes are the carriers of the embryos. The parent worm inhabits the lymphatic trunks, and its ova are thence swept into the general circulation. The supposition is that the greater the obstruction by the parent worm or its embryos, the more severe the elephantiasic symptoms, resulting, in the graver class of cases, in bursting of the vessels distended below the point of obstruction and a consequent lymphorrhagia or hæmorrhage. In the milder cases the circulation is in part preserved at the point or points of greatest interference with the lymph or sanguineous current.

In the cases which can not be cited as belonging to the endemic class, it is clear that a series of obstructive disturbances may produce a chain of morbid symptoms sufficient to strongly resemble those of the group described above. The two are scarcely distinguishable. In this way the constriction produced by gummata, by indurations due to streptococci of erysipelas, phlegmasia alba dolens, phlebitis following typhoid and other fevers, repeated inflammatory attacks (eczemas, obstinate psoriasis of the lower extremities), sarcoma involving the large vessels of the lower limbs, the girdling of the latter with bandages and improperly adjusted surgical appliances, may induce an elephantiasis scarcely to be differentiated from the endemic form.

Etiology.—The essential causes of the disease have been considered above. It occurs in all countries and all climates, and affects more men than women (about four times as many of the one sex as of the other), merely because of the exposure of the one to a greater extent than the other to the several causes of the malady in countries where women are more protected from these exposures. A few congenital cases are reported. Persons of dark races, and those living in unfavorable climates and with bad hygienic surroundings, are without question much more likely to exhibit evidences of the disease. An argument has been made to show that the malady acknowledges the geographical distribution of the mosquito. Nonne (Virchow's Archiv, Band cxxv) reports four cases in which the disease was apparently congenital, with a history of involvement of several members of the family in generations.

Diagnosis.—The recognition of the disease is simple. The elephantiasic aspect of the affected part, its enormous volume, its firmness, its warty or telangiectasic surface, and in some instances the history of repeated attacks of erysipelas, elephantoid fever, recurrent eczema, or lichen planus, point to the nature of the disorder. When erysipelas is actually

present the thermal variations are significant. When the lower extremity is chiefly involved, and in countries where the disease is not endemic, care should always be taken to examine the limb above the line of tumefaction for evidences of constriction, as when bandages have been improperly made to encircle the limb. The syphilitic cases, which are more common than is generally supposed, are exceedingly interesting from a diagnostic point of view. With care one can distinguish in all, often deeply set in the tumefied derma, circular or ovoid cicatrices, thin, lustrous, not attached to the underlying structures, and arranged in characteristic combinations of the letter S, the horseshoe, the figure of eight, etc. In all these cases the disease is due to gummatus obstruction of the part, and generally yields with readiness to appropriate therapeutical measures. The cases where in the same region there is deep, almost blackish pigmentation, are more often due to varices of the blood-vessels, and consequent thickening, eczemaform attacks, and often varicose ulcerations lasting for years, with an ever-increasing augmentation of the volume of the limb, due to the disuse of it as the pain and tenderness increase.

Prognosis.—The resources of modern medicine and surgery have changed the prognosis of elephantiasis. Even the worst of cases may be wonderfully improved, and often wholly relieved, by appropriate measures. The endemic cases are greatly benefited by a change of climate. As a rule, those are to be regarded as most hopeful where the disease has not existed for long periods of time. Even, however, in those which have persisted for nearly half a century, and where the deformity is most striking and intolerable, the relief has been brilliant and permanent.

Treatment.—During the febrile accesses of the disease, those which precede its earliest manifestations and those which so often accompany its evolution, the patient is to be given the usual cooling draughts and the antithermal remedies which have been found effective in the management of fevers in general (phenacetine, the salicylates, the cinchonas, etc.). At other times resort should be had to the internal administration of iron, the hypophosphites, the mineral acids, cod-liver oil, and a nutritious diet. The hygienic management of these cases is of the highest importance whatever the cause, and often involves a change of climate and a residence where the disease is not endemic, and where also there is an absence of malaria, of much dampness, and of vitiated air. As the causes of elephantiasis have been found to be both numerous and different, it follows that the internal treatment is to be varied according to the indications presented in each separate case. Many patients require the use of the iodides in the fullest doses to relieve them of the gummatus infiltrations whose projecting masses and deep-seated nodules have been chiefly effective in the production of the obstruction to the circulation in the parts involved.

The local treatment of advanced cases is by excision, with proper surgical precautions, of all the larger tumors. In this way growths of several hundred pounds' weight have been removed. In the case of genital tumefactions the penis and testicles have been carefully dissected out from the sulci in which they are lodged, with the result, after cicatrization has been accomplished, of leaving these organs unimpaired. Ligation of the larger vessels, as inducing still further obstruction of the vascular channels, is now practically abandoned as a therapeutic measure. The aid received by compression with the elastic bandage is in most cases considerable. Persistent compression of affected parts has been continuously employed for long periods of time with excellent results. Bandages for this purpose are preferably made of rubber, but have been effective when made with flannel cut on the bias, and even with the ordinary roller bandage of the surgeon, applied over compresses. Methodical compression of the vessels supplying an elephantiasic mass has been in cases successful, and in others followed by gangrene. Inunctions with mercurial, salicylated, tarry, and other medicated ointments are often indicated, and in some cases serve an exceedingly useful purpose. Alterations of hot and cold local baths, steaming and showering the parts, massage, and the use of the constant electrical current have all been employed with advantage, and, seeing the variety of causes effective in the production of the disease, are in some cases decidedly more available than in others.

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ACROMEGALY. (PRINCE A. MORROW.)

Deriv., *ακρον*, extremity; *μεγας*, great

Synonyms: Acromégalie; Pachyærie; Marié's Disease.

Definition.—A rare disease, clinically allied to elephantiasis, in which there is a more or less progressive and symmetrical overgrowth of the bones and soft tissues, confined chiefly to the face, hands, and feet.

Acromegaly was first described by P. Marié in 1886. Since then perhaps a hundred cases have been reported under this title, many of which were probably examples of other forms of disease. The term has been incorrectly applied to *leontiasis ossea*, characterized by the formation of osteophytes or bony tumors on the face and cranium.

Symptoms.—Ordinarily the first symptom which attracts the patient's attention is the increase in size of the extremities, necessitating a larger hat, gloves, or shoes. From this time onward there is a progressive and more or less continuous growth of the structures of the face, hands, and feet, and sometimes of other parts of the body. The enlargement does not affect the bones of the cranium, but is more particularly marked over the prominent and projecting parts of the face—the forehead, nose, lips, chin, and ears—creating an appearance of the face being too large for the head. The hypertrophy affects the bones and cartilages as well as the soft tissues of the parts. The supra-orbital ridges project, the soft parts being thrown into rugæ or folds of hypertrophied skin. The malar bones, the inferior maxillary and more rarely the superior maxillary, the cartilages of the bone and of the ear, also undergo hypertrophic changes. The nose becomes broad and thick, and the lips large and protuberant, often assuming an elliptical shape. The tongue is not infrequently enlarged to more than double its normal dimensions. The external ears often attain an abnormal size.

The hands present most characteristic changes. The metacarpal bones and phalanges as well as the bones of the wrists become hypertrophied. This, with the enlargement of the soft parts, gives them the appearance of "enormous paws." The fingers are enlarged in all proportions, the tips of the same size as the bases, resulting in the characteristic "sausage shape." Corresponding changes take place in the soft and bony tissues of the feet, giving them a thick, "massive," "colossal" appearance.

The skin over the affected surfaces is commonly yellowish and wrinkled; exceptionally it has been described as pale and waxy. The growth of hair is everywhere more abundant; the skin is frequently dry and harsh to the feel from diminished sebaceous secretion; the perspiration function is commonly increased. Small fibromatous growths over the face, neck, back, and chest have been noted in many cases. In women, cessation of

menstruation, and in men, impairment of sexual appetite and power, are symptoms which almost invariably mark the beginning of the disease. The associated general symptoms, the impairment of the special senses of sight and hearing, and the neurotic phenomena referable to disorders of the central or peripheric nervous system, are chiefly of interest to the neurologist.

Etiology.—The cause of the disease is unknown. It has been variously attributed to pathological changes of the brain and cord, enlargement of the pituitary body, enlargement of the thymus and of the thyroid glands, but post-mortem examinations have not demonstrated the existence of any of these assumed factors as a constant condition. Freund considered the disease a manifestation of a species of atavism in which there was a tendency to a reversion to the negro and ape types.

Sex seems in no way to predispose to the disease, as men and women are about equally affected. It is essentially a disease of middle or late life. In the majority of cases evidences of the disease were first manifest after the age of thirty-five, although some cases have been reported as developing in the second decade of life.

Diagnosis.—Acromegaly should not be confounded with the condition known as *gigantism*. In the latter, excessive size is the only departure from the normal standard; the overgrowth is not limited to certain parts, but there is a symmetrical development of the whole body without disproportion of the different parts.

From *myxœdema*, for which it has been mistaken in many of the cases reported, it may be differentiated by the fact that the enlargement in the former disease is due to an increase of fat in the subcutaneous tissues and skin, with deposits of mucin in the connective tissue, without involvement of the bony structures. It is always accompanied with marked changes in the thyroid glands and characteristic neuritic symptoms. The round, "moon-shaped face" of myxœdema is altogether different from the elongated oval or "elliptical" face of the disease under consideration.

Arthritis deformans may bear a close objective resemblance to acromegaly, especially involving the hands and feet. The absence of hypertrophy of the soft tissues, the successive involvement of one bone after another, instead of simultaneously as in acromegaly, and the stiff, ankylosed condition of the joints, are points of distinction.

Prognosis.—The prognosis is always unfavorable; the disease is progressive and unyielding.

Treatment.—Acromegaly is not curable. Various drugs—ergot, arsenic, strychnine, phosphorus, etc.—have been tried without affecting materially the progress of the disease. Baths and electricity have been employed without benefit. Pain and other subjective symptoms may be relieved by appropriate means.

MYXŒDEMA. (PRINCE A. MORROW.)

Deriv. : *μυξα*, a humor ; *οιδεω*, to swell.

Synonyms : Cretinoid Œdema ; Fr., *Cachexie Pachydermique*, *Athyroidie*.

Definition.—Myxœdema is a constitutional affection, characterized clinically by pachydermic and other cretinoid changes, and anatomically by atrophy of the thyroid gland.

This disease was first described by Sir William Gull in 1873, under the name of *cretinoid œdema*. Later, Ord recognized that the cutaneous œdema was due to a proliferation and deposit of mucin in the superficial connective tissues, and proposed the name of myxœdema as representing the most characteristic change. In 1879 it was described by Charcot under the title of *cachexie pachydermique*. As the disease is in all cases associated with disappearance of the thyroid gland, Besnier proposed to denominate it *athyroidie*.

Symptomatology.—While myxœdema may occur at all ages, the large majority of its subjects are women who have passed the menopause.

The cutaneous changes consist essentially in an œdematous swelling, with thickening and induration of the skin and subcutaneous tissues, first affecting the face and afterward extending to other parts of the body. The œdematous skin is firm and inelastic, and does not pit on pressure. The tongue, uvula, and other soft parts of the buccal cavity also participate in the œdematous process.

The tumefactive changes are especially marked in the face, rendering the features broad and coarse, obliterating the lines of expression, and curiously altering the entire physiognomy.

The clinical picture of a well-marked case of myxœdema is pathognomonic. The slitlike openings between the puffed and swollen eyelids, the exaggerated arch of the brow, caused by the effort to retract the upper lid, the broad and thickened nostrils, the everted and pendulous lower lip, the widening of the lower part of the visage, creating the typical "moon-shaped face," the masklike immobility of features, are all so characteristic as to be readily recognizable.

The local tumefaction of other regions is scarcely less characteristic. The supraclavicular spaces become filled with cushions of fat, the fingers are swollen and thickened, giving the hand a spadelike appearance. Over the articular regions the tissues are also thickened, interfering with suppleness of the joints and freedom of movement. The skin of myxœdema is pale, waxy, or yellowish, with oftentimes an illy defined brawny redness of the cheeks ; over the extremities it may be livid. It is dry and hard to the feel, with slight pityriasic scalliness ; exceptionally the epidermis exfoliates in large flakes. Characteristic changes take place

in the pilosebaceous and sweat glands. The perspiratory function is diminished or suppressed, with a more or less generalized alopecia, especially affecting the hair of the pubes and axillæ. The nails are fragile and easily broken. The sensibility of the skin is blunted. In connection with the cutaneous changes the physical and mental faculties undergo progressive enfeeblement; mental hebetude and dullness, sluggishness of movement and speech, rolling, unsteady gait, are characteristic features. The speech is halting and slow, and deglutition sometimes difficult. Profound anæmia, renal complications characterized by albuminuria or glycosuria, are almost invariable pathological coincidences. The thyroid gland is atrophied, entirely disappearing or being converted into a fibrous mass. The temperature is subnormal.

Etiology.—The causes of myxœdema are obscure. The influence of heredity is generally conceded, from the fact that the disease seems in many instances to run in families. The clinical features are identical with those of sporadic cretinism, in which there is congenital deficiency of the thyroid gland, and suggests a like pathogenesis. This view is further confirmed from its analogies with operative myxœdema in both man and the lower animals. According to Osler, it developed in sixty-nine out of four hundred and eight cases after partial or complete extirpation of the thyroid gland. When there was a fragment of the gland left and the animal kept warm myxœdema was averted. Patients are always better in warm and worse in cold weather.

Diagnosis.—The differential points between myxœdema and acromegaly have already been given. Clinically the œdema of Bright's disease most closely resembles that of myxœdema, but the absence of other characteristic signs and the presence of pitting will serve to distinguish them.

Treatment.—The treatment of myxœdema has always been disappointing until the recent introduction of "thyroid feeding." During the present year (1893) a number of communications have appeared detailing the brilliant results accomplished by this new method. The thyroid extracts may be employed in the form of a powder obtained by evaporation, or the expressed juice from the freshly prepared gland, combined with glycerin, and a small proportion of phenic acid may be used. The glands obtained from young lambs are preferable for this purpose. The extract may be given hypodermatically or by the stomach.

Most observers report a rapid and prompt amelioration of all the psychical and physical symptoms with a notable reduction of the myxœdematous swelling. The improvement does not extend to a radical cure.

CLASS IV.—ATROPHIES.

LEUCODERMA. (FRANCIS J. SHEPHERD.)

Definition.—By leucoderma we mean a condition of skin in which there is absence of the pigment normally present. In consequence, the skin appears white. This absence of pigment is much more apparent in the dark and colored races. Leucoderma may be congenital or acquired. The acquired condition is usually called *vitiligo*, or *leucoderma acquisitum*.

By *congenital* leucoderma we mean a condition of skin in which there is a congenital absence of pigment, partial or universal. When partial, it has by some been called *congenital leucoderma*, and, when complete, *albinism*. In the latter case there is absence of pigment in other tissues also, and the individuals are called *albinos*.

ALBINISM. (FRANCIS J. SHEPHERD.)

Definition.—Congenital absence of skin pigment, which is universal, and involves other tissues as well as the skin.

Symptoms.—The individuals the subjects of this affection are called albinos. There is not only a total absence of pigment in the skin, but also in the hair, iris, and choroid. In parts the skin may be pure white; but where the skin is thin it has a pinkish color, for, owing to its transparency, the blood-vessels are seen through it. The hair is very fine and silky, and may be yellowish or pure white. In one case it was seen to be red (Folker). The iris is of a pinkish color, owing to absence of coloring matter in it; and the pupil is red, because the dark pigment of the choroid is wanting.

In consequence of the eye having no protection, there is inability to withstand strong light (photophobia), a constant movement of the eyeball (nyctalopia), lids, and iris (nictitation), and a screwing up of the eyelids, to lessen the amount of light entering, as if the patient were short-sighted.

Usually albinos are by no means of a strong constitution, and may have a tendency to tuberculosis. In some cases the patient is mentally as well as physically deficient. Albinism is observed more commonly in the dark races.

The condition is seen all through the animal kingdom—white ravens, ferrets, rats, etc., not being uncommon. Many animals become white in winter.

The skin is perfectly healthy, and only differs from the normal by the absence of pigment.

Etiology.—The cause of albinism has not yet been made out, but in some cases it may be hereditary, though even these cases are so few as to make the question of heredity a doubtful one. The issue of two albinos might be an albino, but it is certain that the children of a universally pigmented individual and an albino are most commonly not deficient in pigment. On the other hand, vigorous parents with the normal amount of pigment may produce albinos.

The affection is said to be endemic in some tropical countries, as Lower Guinea, Loango, etc. (Crocker).

Treatment.—The condition is without remedy, and the absence of pigment is always permanent. Hyde suggests that the transfusion with the blood of a vigorous black-skinned negro would probably modify the color characteristics of the true albino; but I should be inclined to doubt this very much.

PARTIAL ALBINISM.

This affection is called leucoderma by some authors. It is seen chiefly in negroes at birth, and gives them a piebald appearance. The patches are well defined and circular in shape, and either white or pinkish-white. They remain unchanged through life, though some state that they become larger as the individual grows older. They are found in the scalp, breasts, face, and genital regions, and are often symmetrical; the hairs growing from the skin, where pigment is deficient, are white.

This affection is similar to the congenital pigmentary nævi of white people, which remain unaltered through life, though the condition is reversed. It is said by Kaposi that partial albinism is not confined to the colored races only, for he believes he has often seen the same condition in white people. This affection is seen in white patches, often symmetrical, in various fur-bearing animals, as the skunk, guinea pig, etc.

No treatment is of any avail.

VITILIGO. (FRANCIS J. SHEPHERD.)

Synonyms: Leucoderma Acquisitum; Leucopathia.

Definition.—An acquired absence of pigment in the skin, occurring in round or oval patches, which are sharply defined and smooth. The edges of these white spots have a marked increase of pigment.

Symptoms.—This disease, which is common in tropical countries and in the dark races, is somewhat rare in northern climates.

It is purely a condition of pigmentary deficiency, and the general health of the patient remains unimpaired. It occurs in patches, small at first, and then increasing in size gradually. These patches are small or oval, and perfectly smooth. If hairs exist on the part they are colorless; the edge of the patch is deeply pigmented, so that the white spot stands out prominently from the rest of the skin. The skin forming the spot is perfectly normal in texture and function, the only abnormal condition being absence of pigment. The skin secretes well, and the hairs are firmly implanted in their follicles.

The patches may be limited and small, or very extensive. Cases are on record where negroes have become perfectly white. Small spots coalesce and make large irregular patches which have a maplike appearance, the continents and islands being represented by the normal skin. The spots always have convex edges, and the darker borders are concave. Occasionally, when the loss of pigment has become general, the brown or dark patches of healthy skin look more like the diseased condition, and have often been taken for the diseased parts. This affection is more conspicuous in summer because of the tanning the healthy pigmented skin gets from the summer sun, and in consequence the contrast in color with the white patches is greater.

The disease spreads slowly, and takes years to involve extensive areas of the surface of the body. It may commence as a small spot on one part of the body, as the hands, face, neck, scalp, pubic region, and after some months may appear in other parts of the body, giving the patient a piebald appearance. It is often quite symmetrical, and is, of course, conspicuous in the uncovered parts of the body, as the hands, face, and also in hairy parts. All the time the disease is progressing there is no impairment of the general health, though in some a condition of hypochondriasis is developed, owing to the fact that a certain amount of disfigurement occurs, especially should the skin of the face be involved.

Etiology.—The cause of vitiligo is unknown. It has been stated that in certain cases it follows injury or exhausting diseases. Hebra has pointed out that the first white spot may appear close to an already existing pigmented mole. The writer has seen a case where the disease commenced from the pressure of a collar-stud; another from the spots left after burning warts. It occurs with equal frequency in both sexes, and shows itself in early adult life—rarely before ten years of age and after thirty. It is said to be more frequent in dark races, but it is probable that it occurs as often in the white races, the disease being more often noticed in dark races owing to the greater contrast of color.

It is held by some that the disease is due to a disturbance of innervation—an explanation which tells us nothing, and is only a cloak to hide our ignorance, for nothing is known of its pathology; the microscope reveals nothing but absence of pigment.

Diagnosis.—This is usually easy; the character of the spots, their symmetry, smoothness, and absence of pigment, together with the continual increase of the unpigmented area, will serve to distinguish vitiligo from any other disease. Chloasma has been confounded with it, but here the spot is yellowish or brownish.

The general good health of the patient, together with the absence of anæsthetic spots and structural alterations of the skin, would serve to distinguish it from leprosy.

Prognosis.—The spots tend to increase in size with advancing years, but some cases of spontaneous cure have been reported. In other cases



FIG. 27. — Vitiligo.

of supposed cure the disease has invaded the whole surface of the body, and in consequence no color contrast exists. The general health remains unimpaired throughout.

Treatment.—This is most unsatisfactory. We are unable to cure by external or internal treatment. At best we can lessen its disfigurement

by removing the excess of pigment which occurs around the edges of the spots by means of acetic and other acids, caustic alkalies, corrosive sublimate, etc. The white spots may be stained and burned with lens, or



FIG. 28.—Vitiligo.

blistered with mustard, cantharides, croton oil, etc., in the hope that the fresh epidermis produced may be of a darker color, but it is the experience of nearly all dermatologists that treatment is of no permanent use.

ATROPHY OF THE SKIN. (FRANCIS J. SHEPHERD.)

Synonym: Atrophia Cutis.

Definition.—Atrophy of the skin may be primary or secondary, partial or general. All the tissues forming the skin waste in some cases (quantitative), and in others one or more only are diminished (qualitative); the hair, nails, and underlying tissue may participate in the wasting.

Degenerative Atrophy.—Atrophy of the skin may consist of some qualitative change in certain structures of the skin without actual diminution of bulk; in fact, there may be an increase due to hypertrophy of connective tissue. The skin is hard, has a waxy look, and is either whitish or yellowish in color. There is something unnatural about its appearance. It appears as if too small for the part it covers, and feels distinctly thinner.

Simple Atrophy.—In *quantitative* or simple atrophy the skin is thin, shriveled, and dry; often very white, but sometimes pigmented. There is in this form a diminution of all the constituents of the skin.

Atrophy of the skin may be primary or secondary, and each form may be general or local. The secondary or symptomatic atrophies follow such diseases as lupus, favus, syphilis, scleroderma, etc. Sometimes it is due to traumatism, and follows injury of nerves; in the latter case all the tissues waste, and the skin becomes dry, hard, and shriveled.

Primary or Idiopathic Atrophy.—This occurs as a general affection in atrophia senilis and as a local one in atrophia maculosa et striata. Overstretching is one of the causes of local primary atrophy (*lineæ albicantes*), and is seen in the breasts and abdomens of women who have borne children. Sometimes the atrophy follows the course of certain nerves.

ATROPHIA SENILIS.

This is, as its name implies, an affection of old age, and accompanies other evidences of senile changes. The whole skin may be affected, the subcutaneous tissue, and also the appendages of the skin. It may be simple or quantitative, degenerative or qualitative, but commonly both conditions exist together.

The skin is thin and in folds, is inelastic, and looks shriveled, dry, and wrinkled. It is freely movable, and can be easily pinched up. The skin may be pale, but it is usually of a dark-brown color. On the arms, face, neck, back of the shoulders, are seen warty-looking accumulations of yellowish-brown epidermis which can be easily lifted off with the finger-nail, exposing hypertrophied papillæ. The mass which forms this discoid, warty-looking growth is the product of the sebaceous glands. Absence

of the hair is characteristic. When present it exists as lanugo. Prurigo sometimes accompanies this affection. The condition appears to be one of drying-up the tissues of the skin; they have lost their juiciness.

Morbid Anatomy.—According to Neumann, the epidermis is thinned, forming a wavy line over the papillæ of the corium, which are much diminished in size or wanting altogether. The corium is usually thinned, and its connective-tissue corpuscles are smaller and fewer in number. The pigmented changes are irregular; the vessels are here and there filled with pigment, which is also interspersed between the bundles of connective tissue. In most cases the hair-follicles are in good condition, yet in many the papillæ have shrunk or disappeared.

The sebaceous glands are markedly altered. In some cases they consist of a mass of yellowish-brown substance, and in others they are dilated, their acini being distended with accumulation of epidermic scales. The fat-cells are few in number or wanting altogether. The sweat-glands are unaltered.

In the degenerative atrophy the constituent elements are much altered, especially the connective tissue, which is infiltrated by fine and coarse granules, and becomes converted into homogeneous tough or brittle masses. This is called granular or vitreous degeneration, and has been by some described as amyloid or fatty degeneration.

ATROPHIA MACULOSA ET STRIATA. (FRANCIS J. SHEPHERD.)

Synonym: *Atrophoderma Striatum et Maculatum*.

This variety of atrophy of the skin may be idiopathic or symptomatic.

Idiopathic Atrophy.—The idiopathic forms usually occur in bluish-white striæ or streaks, which are depressed, smooth, glistening, and have the appearance of cicatrices. The striæ are much longer than they are broad, measuring often several inches in length by only a few lines in breadth. Occasionally the atrophy occurs as spots, which are round or oval in shape and situated in various regions over the trunk and extremities. The striæ occur most frequently in parallel lines running usually in an oblique direction, often following the natural lines of the skin. In the body these lines are in a direction parallel or nearly so to the long axis of the body, but frequently at right angles in the extremities. Sometimes the lines have somewhat of a spiral arrangement, several being grouped together, while again they may have a wavy, broken course. On running one's finger over the spots a depression is felt, as if the finger was crossing a furrow, and the skin seems thinner than in the unaffected parts. The shape of the striæ is often elliptical, tapering at the two ends. The

favorite sites for these striæ are about the hips, buttocks, iliac crests, and breasts of women. They are less frequently seen in the trunk and extremities. In the young especially they may follow severe illnesses and fevers such as typhus and typhoid. This fact, although for some time recognized by clinicians, is not alluded to in most of the works on dermatology. As these atrophic striæ or spots appear without known cause they are very insidious in their development, and are very persistent, lasting for years. They occur at all ages and in both sexes. At first their color is of a rose or purplish hue, becoming more white and shining as time goes on. They give rise to no inconvenience, and may remain for some time unnoticed by the patient. The skin over the atrophic areas is quite as sensitive as in other parts.

When the affection occurs in spots, or maculæ, the distribution is not so extensive. These spots range from the size of a large pea to that of an almond, and are situated more commonly about the face and neck. Cases have been described by Cantani (*Il Morgagni*, May, 1883) where the maculæ have a bluish-red color, due to the development of minute vascular capillaries. According to Liveing and other observers, in the macular variety the spots first have an erythematous appearance, are raised above the surrounding skin, and are hard and fibrous; in fact, the first stage is one of hypertrophy. In the second stage there is atrophy, and the skin becomes white, glistening, and depressed. Dr. R. W. Taylor, of New York, has reported a case of atrophy of the skin which began as a brownish discoloration, and describes another where the atrophied spots behind the ear had a violaceous margin, and from this, later on, a brownish discoloration covered the patch.

Etiology.—Shultze examined several hundred persons in reference to the frequency of these atrophic striæ, and found that thirty per cent of women who had never borne children were affected with striæ on the buttocks and thighs, and six per cent of men; of tall men twenty-five per cent. He considered these striæ to be due to the rapid growth of the pelvis, which causes stretching of the skin. In women the pelvis increases chiefly in breadth, and the striæ were parallel to the long axis of the body; but in men the growth of the pelvis is in length, and hence the streaks have an oblique course. This explanation does not account for the macular variety, and those cases occurring after fevers and other acute diseases. In some of the reported cases, where striæ occurred on the abdomen, there had never been distention, but, on the contrary, marked emaciation. The fact that in some cases a hyperæmic stage precedes the atrophic, and that in Wilson's cases the white anæsthetic streaks were developed in the course of nerves, would point to a trophoneurotic cause. As before observed, both striæ and maculæ occur in adults of both sexes and at all ages.

Anatomy.—Kaposi excised a piece of skin from an atrophic streak in the left thigh of a young man, and found the epidermis and mucous layers much atrophied, and almost complete obliteration of the papillæ; the connective and elastic tissue consisted of only a very few thin bundles, and there was diminution of the glands, vessels, and hair-follicles, and almost an entire absence of fat-cells. Langer says these lesions are not due to rupture, but to disarrangement of connective tissue. In a microscopical examination of an excised portion of skin by Jadassohn, of Breslau (Transactions of the German Dermatological Society, Leipsic, 1891), there was found a more or less complete disappearance of the elastic fibers. Jadassohn thinks that inflammation is the prime factor in causing the atrophy and disappearance of the elastic element. Troisier and Menetrier failed to find any evidence of true atrophy; the elastic fibers were simply torn through and curled up at their broken ends. With such discordant views regarding the actual conditions of parts as they appear under the microscope, it is probable that the lesions may be produced by various causes. Overstretching does not account for all cases, so we must look for some trophoneurotic cause to give a satisfactory explanation in some of these cases.

Symptomatic Atrophy.—In the symptomatic variety the affection is due to definite traumatic or pathological lesions. It may be simple or degenerative. Besides the simple form are classed the partial atrophies due to pressure or distention. The striæ seen on the abdomen and breasts of women who have borne children (*lineæ albicantes*), or who have had the parts overstretched by tumors and other causes, are examples of this form. In these cases the deep layers of the corium are excessively stretched and partially ruptured, as is also the subcutaneous tissue. The striæ are developed in greatest numbers about the sixth or eighth month of pregnancy, and first manifest themselves as bluish-red hæmorrhagic stripes or striæ, due to the rupture of blood-vessels. There is often pain or troublesome itching. With the absorption of the effused blood the parts become deeply wrinkled, brownish, and later white, smooth, and glistening; furrows take the place of these wrinkles. These “false cicatrices,” as Virchow calls them, look very much like scars, and remain through life. The atrophy which affects these parts is confined to the deeper structures of the skin and the fatty layer. Overstraining, as in coughing, etc., may lead to the formation of atrophic striæ. Similar forms of atrophy are produced by favus crusts, corns, callosities, etc.; being due to external pressure. Again, in chronic, inflammatory, and febrile diseases atrophies sometimes ensue.

Wherever there is dense cell infiltration into the corium, as in syphilitic nodes, tubercles, lupus, leprosy, lichen ruber, planus, etc., white atrophy is apt to occur.

The thin, glistening scars left after the healing of a lupus must be regarded as an atrophy of the skin, and not a true scar (Kaposi).

The spots, if small, may disappear in time, owing to the contraction of the skin from its natural elasticity.

Degenerative Symptomatic Atrophy.—The degenerative form of symptomatic atrophy occurs usually in connection with the chronic forms of skin lesions—e. g., chronic eczema, lupus, ulcers of the leg, pemphigus foliaceus, recurrent erysipelas, syphilitic and recurring dermatitis, gummata of the ulcerating variety, etc. In these cases the vessels themselves undergo a change from pressure or the spread of the inflammatory processes, and consequently diminish the amount of blood going to the part, and hence proper nutrition is interfered with.

The degenerations are fatty, hyaline, and lardaceous, are fully described in pathological works, and can be most clearly shown in the connective-tissue fibers. The atrophy is the result of a pathological process, and not a disease of itself.

Treatment is of no avail in any form of atrophy.

PERFORATING ULCER OF THE FOOT. (FRANCIS J. SHEPHERD.)

Synonym : Mal Perforant.

This remarkable affection, the pathology of which is still obscure, and whose name is misleading, comes under the care of the general surgeon rather than the dermatologist. The disease has long ago been well described by French surgeons as "*mal perforant du pied*," but its pathology was never, with some few exceptions, attentively studied. Savory and Butlin (Medico-Chir. Soc. Trans., 1879, vol. lxii, page 373), in a valuable paper, have described the disease thoroughly, and dealt at length with its pathology. In the first place, the term *ulcer* does not accurately describe the disease. According to Savory and Butlin, "it varies in character, and in some instances there may be granulations, occasionally even an external mass of them, around the orifice: but usually a small aperture, like the orifice of a sinus, is seen in the center of a large corn, and this leads directly down by a narrow channel to exposed and diseased bone." Around the granulation is a flattened area of whitish-yellow and thickened epidermis. The situation of the ulcer is usually where pressure is greatest on the plantar surface and over the metatarso-phalangeal articulation of the great toe, or less frequently the little toe. It may occur in other places, as over the same joint in other toes, or over the heel. Terillon has reported a case where the metatarso-phalangeal articulation of the ring-finger showed a similar ulcer to that occurring in the foot.

There is very little discharge from the sinus, and there is no pain, the

ulcer itself being apparently quite insensitive. The anæsthesia may be detected in the course of one or two of the cutaneous nerves going to the foot. Although the ulcer is insensitive walking is very painful.

In some cases the ulcer is hypersensitive. The affected foot tends to sweat profusely, and the sweat is often very fetid.

The progress of the disease is very slow, the ulcer healing when the limb is placed at rest for a long period and breaking out when the individual starts to walk again. Frequently there is complete disorganization of the metatarso-phalangeal joint.

Pathology.—The ulcer is probably the result of pressure or injury to structures already deprived of their proper nutrition and hence defective in their vitality. How the ulcer is produced is not known, but authorities state that it is due to some degenerative nerve lesions. These are divided into two classes, peripheral and central. It is commonly seen in connection with those diseases where there is damage to some nerve center, as in locomotor ataxia, or to the nerve trunk, as in leprosy, syphilis, etc., or when the peripheral nerves are affected, as in peripheral neuritis, the terminal sensory nerve fibers suffering from the direct result of pressure by increase of the endoneurium. It is most commonly seen in connection with locomotor ataxia and in the later stages of the disease, and also occurs in patients the subjects of diabetes.

Treatment.—This is most unsatisfactory. As before stated, long-continued rest and removal of the diseased bone may result in the healing of the ulcer, but on the patient resuming active habits the disease again breaks out. Excision of the joint and toe is insufficient. In cases of true perforating ulcer with anæsthesia, amputation of the foot (Chopart's or Syme's) must be undertaken. Should a fresh ulcer appear on the stump, it is better to at once amputate below the knee through the tubercle of the tibia.

If the patient refuses to submit to such severe measures, then the only alternative is the use of an artificial leg, applied to the bent knee, and a padded shoe to the foot. By this means pain is avoided and rest is always obtained. The results of treatment by operation, even when promptly performed, are not very brilliant, as the affection occurs as a complication in the later stages of such diseases as diabetes and ataxia. The patient is in such a debilitated condition that gangrene usually attacks the amputated limb and death by exhaustion follows.

GLOSSY SKIN. (FRANCIS J. SHEPHERD.)

Synonym: *Atrophoderma Neuriticum*.

This is a trophoneurotic affection of the skin which has been described by Paget, Weir Mitchell, Keen, and others. It is most commonly seen in the fingers, and Paget describes glossy fingers as being "tapering, smooth, painless, and unwrinkled, glossy, pink and ruddy or blotched, as if with permanent chilblains." Several fingers may be affected, and the skin is easily inflamed, fissured, and excoriated. The affection is preceded and followed by severe pain of a burning character. There are dryness of nails and loss of hair, which many authorities regard as quite distinctive. It follows the severe neuralgias, wounds, and other lesions of nerve trunks.

In some cases of inveterate neuralgia of the fifth nerve the face has a smooth, shining, expressionless appearance on the affected side. A somewhat similar affection appears on the toes, with tendency to ulcerate at the clefts. The parts, instead of being dry, are covered with an acid sweat, and are extremely painful.

Etiology.—Injuries to nerves, as well as disease, furnish the chief causes. It has been seen complicating gout, leprosy, rheumatism, and in some cases of chronic myelitis.

Pathology.—There is no doubt that it is a trophoneurotic disease, and that it is produced by either a central or peripheral nerve lesion which may be due to disease or injury. It is closely allied to symmetrical gangrene (Raynaud's disease), "dying of fingers," perforating ulcer of the foot, etc.

Treatment.—The parts should be protected from cold, and not allowed to be injured in any way. The cure of the case depends on the removal of the cause and restoration of normal nerve supply.

AINHUM. (FRANCIS J. SHEPHERD.)

Derived from the negro word meaning "to saw."

Definition.—A disease peculiar to the dark races, in which a circular constriction of the little or other toes occurs, leading to spontaneous amputation.

This somewhat rare disease is met with among the negroes and Hindoos. It is common on the west coast of Africa, West Indies, Brazil, India, Madagascar, and a few cases have been reported from some of the Southern United States of North America.

It was first described by Clark, in 1860 (Trans. Epiderm. Soc.), as "a

dry gangrene of the little toe among the natives of the Gold Coast"; in 1867 by Dr. J. F. da Silva Lima, of Bahia, Brazil (*Gazeta do Bahia*, anno i, No. 13, p. 146), who collected a large number of cases. It is not uncommonly met with in the West Indies. Dr. C. E. Gooding,* of Barbadoes, W. I., who has sent me several specimens of toes which he has amputated, speaks of it as comparatively common among negroes; and besides, it is not confined to the little toes, as some suppose. Dr. D. G. Crawford, of the Indian Medical Service, states (*Edin. Med. Jour.*, June, 1888) that he has met with this disease in India, in the proportion of one to every twenty-five hundred surgical cases. He has seen the great toe and fourth toe affected as well as the little toe. Others have reported cases in which the fingers were similarly affected (Eyles), and in the Museum of the Hôpital Saint-Louis, Paris, is a model of the forearm of a white person affected with this disease.

Etiology.—At one time this disease was supposed to be confined to adults, but cases have been observed in children, and Hornaby (*North Carolina Medical Journal*, September, 1881) reports a case in a negress aged ten.

Males are more frequently affected than females, and the disease is said to be sometimes hereditary. It is confined to the dark races, and affects certain localities. Little else is known as to the causation of this peculiar affection. Some say it is seen only in those who go barefooted. In the case reported by myself the patient had always worn shoes.

Symptomatology.—The disease begins as a furrow on the line of the digito-plantar fold of the little toe. This furrow gradually deepens and encircles the toe; at the same time the distal end of the toe increases to double and treble its normal size, and becomes soft and ovoid in shape. Usually there is no pain, inflammation, or ulceration; but when there is ulceration in the furrow the pain is excessive.

* Dr. C. E. Gooding, of Barbadoes, W. I., in answer to my inquiries, writes me as follows, May 4, 1893: "Out of a total of twenty-five thousand indoor patients treated in our general hospital during the past ten years, there were only fifteen cases of ainhum. The proportion of cases in the outdoor department was much greater, but no record was kept. In my own private practice I have seen twelve cases, five females and seven males, all negroes. I have only known the disease occur once in a child, and this was a male aged eleven years, and never elsewhere than in the toes. I have seen the disease in one instance affecting the second toe, and several times the third and fourth. I do not believe it ever commences as an ulceration of the digito-plantar fold. Some cases go on to their termination without any ulceration. I believe heredity is an important factor in the causation of ainhum. I have known it occur in mother and son, and have also seen two brothers and a sister affected with it."

Dr. Gooding also states that in his experience the process always begins between the toes, spreading thence over the upper surface, and involving the plantar surface last of all. He believes the exciting cause of the disease is the lodgment of particles of gravel between the toes and the consequent irritation induced.

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